



Part 1 Young Again

I

Genius

"Well, Professor Dykstra, I recommend that you try using a cane."

"A cane?" the old man said. "The dawn of the twenty-second century, and the best that medicine can offer me is a cane?" He said it not with bitterness, or distress, but only ironic amusement.

"I'm sorry, Professor, but you *are* one hundred twenty-six years old. There's a limit to what we can do with muscle and nerve past the century mark," the doctor said.

"That's quite all right. I expected as much. Now, where might one acquire a cane?" Dykstra stood, steadying himself against the chair until sure of his balance.

"I had one brought up for you." The doctor produced a shiny, titanium walking stick, with a soft but firm handle and a cushion on the tip. "The stud here on the side adjusts the length." He handed it over.

James Christian Dykstra, the archetypal genius of the age, looked over the walking stick, weighed it in his hand, thrust it firmly into the floor, and said, "Serviceable, but short on character, I think, Doctor."

"You don't like it? But it's the best on the market."

"I have something else in mind," Dykstra said. "But I'll use this one for the time being."

And how much time will that be? he thought as he left the university medical center. He was ancient, well beyond the average age of dying in even this era of extended life, with all his roads traveled and behind him, save one that went on but a short distance ahead.

He decided to walk through the quad rather than summon his car to come get him. It was a beautiful day, after all, cane or no cane.

He saw a student at a picnic table, face buried in a textbook of familiar red, stylus in hand, its tip resting on his computer pad. "May I see what you're working at, young man?" Dykstra asked, walking up to the boy.

The student looked at him. Dykstra wondered what he saw. "If you want . . . sir. It's 4-space physics, the Dykstra field equations," the youth said. *My physics*, Dykstra thought, and it was clear the boy didn't recognize him.

"I recall it well," Dykstra said, examining the book, "from way back in my early days. Is there some particular difficulty you're having? Maybe I can help you."

Skepticism clouded the student's face, then a resigned "it's worth a try" look. "Problem twenty-two. I'm clueless."

Dykstra read the problem, then looked away, letting his mind work, seeing if he still had it in him to solve such problems. He had it. "From the symmetry of the situation, what you should consider is the projection of the 4-space field, its 3-space shadow if you will. Then integrate from zero to pi. The answer is 45.2 joules per meter to the fourth." He smiled, eyes twinkling.

The boy stared at him, his face jumping from pure disbelief to respect bordering on awe. "That's the answer in the back! How did you know?"

"I *see* it in my mind," Dykstra said. "I see the shape of the field."

"But the only person I've ever heard of who can visualize 4-space is James Christian Dykstra himself."

Dykstra smiled.

"Can I have your autograph?"

Dykstra obliged, though he was embarrassed that his signature was but a shaky shadow of its former self.

He left the boy and continued across the lush lawn to the parking area where his car waited. "Open," he said. The door slid aside. The seat moved outward. He dropped into it and was pulled inside. "Home." Gently the car lifted on its Dykstra repulsors, the fields interacting with the matter of the ground to raise the car into the sky and deliver the inventor of Dykstra field physics to his home in the mountains.

Home was a house in a meadow two kilometers up the western side of the Sierra Nevada range. The car grounded and Dykstra went inside, putting the cane aside since another of his inventions—his world-changing inventions—reduced the interior gravity to half standard. "Ahhh, home sweet home."

James Christian Dykstra, acclaimed by the whole Solar System as the smartest man in the world, was feeling his age. He accepted it philosophically, that he was old, that his days were numbered. But he had made more than his share of marks on human civilization . . . when he was younger.

He sat down in his favorite chair, looking out the window past the meadow and into the distance where the sun was creeping toward the horizon, and reminisced—the old man's entertainment.

He remembered those wild days in college, before the Collapse early in the 21st century, with his friends Jamie and Jenny. Ah, Jenny—she'd written his biography. In a way, she'd loved him, and he, her, though it had gone unconsummated. And then the Collapse years, the desperation, and the Moon Rush following, when he'd been instrumental in getting people to return to space to stay. He recalled his meeting with Paul McAndrew, the first Protestant saint. The man had shaken his hand, then looked at him funny, and said, "You are James Christian Dykstra, and through you God will give Man the stars." The memory still sent shivers through him.

The prophecy had come true, after a fashion. Dykstra field physics had made possible so many dreams of science fiction. Force shields, artificial gravity, repulsor beams, cheap fusion—all of these had resulted from his genius. With his inventions and his physics had come new weapons, weapons that the Belt was now using against the Solar Union. He felt bad about that. But humans will be humans.

Still, if mankind reached the stars, it would be by leaping off his giant shoulders, even if he wouldn't be around to see it.

He sighed.

Rousing himself from his memories, and from his chair, he went into the kitchen.

A package sat on the table, a System Patrol courier container. There was a spot for a thumbprint on the top. If the spot was coded for his print, the package would open at his touch. If not, high explosives would detonate, taking out him and the house, too.

He placed his thumb on the pad without hesitation.

The hemispherical endcaps of the container slowly separated, then the middle section split at the top and folded out. Inside was a data cube and a decidedly odd-looking implement, which reminded Dykstra of a hand weapon, though it wouldn't fit a hand properly. A tube projected from one end of the thing, out of the main bulk of two ten-centimeter diameter spheres and a heavy, padded loop—a handle, perhaps.

Dykstra left the implement in the container and took the data cube to his terminal. The cube booted and he redirected the output to his TV screen, which covered half the north wall. A man in a major's uniform appeared. "Hello, Professor Dykstra. I am Major Gerald Moore of System Patrol Intelligence. Within this cube you will find all the data we've been able to wrestle out of the device in the courier container. It's extremely dangerous, so I'd recommend that you follow the operating instructions our scientists were able to come up with before handling it. We lost a man finding out how to work the thing.

"The device is a weapon of extraterrestrial manufacture. That's right, we've encountered aliens. That fact

is not for public consumption. You know what that means. The story of how we came into possession of the device is also in this cube.

"Intelligence has been able to find out how to work the weapon, but not how it *works*. We know how to fire it, how to adjust the length of the beam, and how to adjust the beam intensity. We also know that the beam itself is an X-ray laser. But how the beam is generated is beyond us. The weapon uses Dykstra fields in a way we've never seen before.

"Beyond that, its power source is a mystery—it doesn't seem to *use* anything; not batteries, not capacitors, not nuclear micropiles, not mini fusion generators, and not chips of antimatter.

"We hope you can help us out, Professor.

"One other thing—the aliens are hostile. They opened fire on the first human ship they met, out in the Oort cloud. Their technology is beyond ours. God help us if they take us to war.

"As of viewing this message, you are recalled to active status, Professor Dykstra, under the Wartime Civilian Service Act. We have a place all ready for you at the Patrol High Command on Luna. But for now we'll leave you alone for one week. My courier will contact you on the twenty-first.

"Good day, Professor."

They need me. The thought made him happy. He hadn't worked for the military since he was in his nineties, but not for lack of offering on his part. The System Patrol had always treated him politely when he suggested that he might still be of help to them on some technical matter, but always with refusals. Only last year, the Belt, just before the start of the war, had demonstrated the ability to produce antimatter in vast quantities, tons at a time it looked like. Dykstra had received the news through some old friends on the inside. The knowledge that such a thing *could* be done had set his mind to racing, playing over the possibilities, and in a short time he was ready to make his pitch to the Patrol. He needed intelligence data and the proper facilities, but he was certain he could duplicate the Belt process.

They stiffed him, told him no, said they had their own people working on it, with the underlying implication that he should be content to be a legend and quit bothering them.

"And now you need me, Major Moore." He wasted no time on bitterness over the past, nor gloated that they came to him now. But success, and thus vindication, would taste sweet indeed. He smiled.

"So let us see what else is in this cube." He raced through the contents. Later he would go back for a more thorough investigation, but for now he simply wanted to see what they'd delivered to him.

The speed with which Dykstra perused the information was astonishing, not just for an old man, but for any man. His IQ had never been adequately measured—he never missed any questions on the tests,

never reached his limits. One tester, in frustration, had simply written "IQ over 300" across the top of Dykstra's score sheet and let it go at that. There had simply never been anyone in the age of mental testing with his raw intellectual ability.

"Ah, very interesting." Dykstra was watching visual scenes of the weapon being tested. There were its parts, disassembled—it looked remarkably simple. There were three men out in a field, test-firing, manipulating the settings to make the beam change length from less than a meter to unlimited. There were scenes of the weapon being fired at targets—a fifteen-centimeter-thick steel beam, sliced in two effortlessly; a three-meter-wide crater blasted into a granite mountainside; a one-hundred-thousand-liter tank of water brought to the boiling point, and entirely evaporated, and the gun still not short of energy.

He looked away from the screen to his table. He picked up the weapon. "You will not defeat me," he said, but he smiled at it with admiration.

He caught a glint of light out of the corner of his eye. It was the shiny titanium walking stick, leaning securely in the corner by the door. Characterless.

With a twinkle in his sharp eyes, Dykstra carried the gun with him, took the cane in his right hand, and went outside. "Now is as good a time as any to start my tests," he said to the squirrels playing tag around the trunk of an ancient oak.

The cane was a help, he had to admit, walking out here in a full g field. Crossing his yard he approached the edge of the woods. He had a particular branch on a particular young oak in mind. Ah—there it was.

He leaned his cane against a neighboring tree and examined the weapon. If the instructions were correct, then moving this lever to *here*, and touching this stud just . . . *so . . . Fisssss!* Out came the beam, glowing brightly, too bright to look at for more than an instant. Dykstra's careful eye estimated the length at eighty-five centimeters.

Somewhere behind his eyes, though almost visible to him, his mind started the process of figuring out how the weapon controlled the length of the beam. He couldn't help it—his mind had always worked that way.

He brought the beam against the base of the limb, quickly, and with a brief burst of flame and a blast of superheated smoke, the branch fell to the ground.

"Marvelous!"

Dykstra took his walking stick from the tree and laid it down alongside the branch, measuring. With another flick of the beam he cut the branch to the desired length. As if born to it, Dykstra played the beam against the branch, severing the remaining branchlets, baking off the bark, delicately charring the surface.

The twinkle still in his eyes, he turned off the beam, then reached down for his creation. It was warm to the touch, but not too hot to hold. It left black marks on his palms, but he didn't care. "I'll have to clean you off, and sand you a bit, and give you a coat of wax," he said to the stick.

But carved from a living oak with an alien weapon—the world's first alien weapon—and shaped by his own hands. . . . Now there was a walking stick with *character*.

* * *

Very late at night, in his shop, with a half-consumed and long forgotten cup of coffee sitting within reach, Dykstra was stymied. In two days, Moore's courier would contact him, and he'd be on his way to the Moon. But he'd done no packing yet, hadn't even thought about it. The weapon consumed him.

It had yielded up its secrets with difficulty, and some still escaped him, but yielded up secrets it had. He knew how the beam length was controlled now, knew how the energy of the X-ray photons arriving at the terminating point was returned to the source. The application of Dykstra fields (he wondered what the aliens called them) was ingenious and unique, but on Earth they were his baby after all. No matter what new wrinkles the aliens may have thought up for them, he was sure he could smooth those wrinkles into understanding.

The power source—that was a tricky one. The weapon used mass conversion, turned matter directly into energy, without any of the fuss and bother of fusion, or nucleus splitting, or combining particles and antiparticles. Any kind of matter would do, but in an atmosphere the weapon just used air molecules. *How* it converted the matter into energy his mind hadn't finished sorting out yet, but he had clues.

What stymied him now, what had gotten him out of bed after three desperate attempts to shut his brain off and go to sleep, was Dykstra's complete inability to understand why the weapon *didn't* do something.

The X-ray laser beam had a diameter of 4.238 millimeters. Its projection length could be adjusted from 72.586 centimeters to infinity. The beam intensity could be adjusted from night light to fusion bomb. "So why in the world didn't they make it so you could adjust the beam diameter and the collimation?" Dykstra muttered for the hundredth time. "It would be trivial to add those characteristics. Why didn't they? Didn't they think there would ever arise a time when a microfine beam might be desirable? Could they never foresee a reason to make the beam disperse?"

"Did they just plain *miss* it, or am *I* missing something?"

By his estimate, the alien technology was seventy-five to one hundred years ahead of human achievement. Why not a thousand? He couldn't answer that question. But why didn't they add those features?

The coffee remained, pointlessly, well within reach.

* * *

"Good morning, Professor Dykstra. I'm Lieutenant Robert Nachteggall."

"Yes. Major Moore's courier. I've been expecting you. And I prefer `Doctor.' " The young man stood outside the front door. Dykstra had watched the lieutenant come down onto his mountain, watched the sleek military courier vessel as it dropped below hypersonic speeds way out over the valley and then gently floated down to the meadow that was Dykstra's yard. He had curly blond hair and clear blue eyes, and looked like a nice enough sort. "I'm ready to go."

"What?" Nachteggall said, surprised. "I thought—"

"No, young man. I'm ready to go now. I presume I can find additional clothing on Luna, so everything in that suitcase over there is all I intend to take. Oh, and this cane, too."

"Very well," the lieutenant smiled. "Also, the device . . . ?"

"All packed up in its container. It's on my table. Would you mind getting it while I collect up my suitcase?"

"Not at all."

Presently they were back on the front porch. "House, seal up command Alpha. Standard stand down procedure." Locks gave out audible clicks as they snapped into place. "That should hold her until I return," Dykstra said. "That is, if I return." He smiled at Nachteggall. "At my age you never know."

"I'm sure you'll be returning, Doctor."

"We shall see."

Proceeding across the meadow, halfway to the boat Nachteggall finally insisted on carrying Dykstra's suitcase for him. The old scientist raised no protest. They boarded the craft.

"Care to ride up front, Doctor? There's an extra seat."

Delighted, Dykstra said, "I'd like that very much. But isn't it against regulations? It was the last time I did military work."

"Welll . . . yes it is. But if I tell them you insisted . . . ?" The question was in his eyes as well as his tone.

"Sonny, I insist you allow me to ride up front."

"Very well, Doctor, but it's against regulations." They both laughed.

Dykstra snuggled himself into the chair and looked out the windscreen. *Earth up close*, he thought. *It may be a long time before I see her this close again.*

"I'm setting the internal gravity to half standard, Dr. Dykstra—"

"I've changed my mind about that. Would you mind calling me Chris? I'm going to get `Dr. Dykstra'd' to death soon."

"Okay, Chris. Anyway, this boat has full compensation fields so you won't feel a bit of acceleration—"
Nachtegall stopped. "Uh, you know all this, don't you?"

"I invented the system fifty years ago, Lieutenant."

"Bob. Call me Bob."

The craft lifted gently from the meadow on her Dykstra repulsors, then climbed rapidly riding the atmosphere jets until it reached thirty kilometers' altitude. Once there, Nachtegall was legally permitted to activate the drive, and hot plasma blasted out of the tubes, heated by a speck of antimatter.

"We'll do this trip at three gees, Chris," Nachtegall said after they'd cleared the atmosphere and Dykstra was enjoying the stars splayed out before him. "A couple of hours from now we'll be dirtside again at the High Command."

"Good."

They filled the time with conversation. Though more than a hundred years older than the lieutenant, Dykstra found it easy to talk to the young man, who was refreshingly free from the sort of intimidation that most people felt whenever they talked to "the smartest man in the world."

They talked about the war. Nachtegall resented being stuck as a courier while there was a war on, even though he felt that this war with the Belt was unfortunate.

Though animosity had existed between the Solar Union, consisting of the four inner planets and the major moons of the outer planets, and the Belt since the latter had won its independence a half century before, it had rarely escalated beyond minor skirmishes.

But this time things had gotten out of hand.

The gas giants have complex satellite systems. Along with the large moons over 300 kilometers in diameter, the big planets also have a plethora of smaller moonlets and rocks. Jupiter has practically its own asteroid belt consisting of rocks less than a kilometer across. The Solar Union claimed those rocks belonged to it. But when large heavy metal strikes were made in the Jovian belt, the Belt decided to challenge that claim.

Negotiations went nowhere, shots were fired, and the war was on.

"Now, don't get me wrong. I'm as patriotic as they come. But this `war of the little rocks' is damn silly. Who cares if the Belt skims a little from the Jovian belt? There's plenty to go around. Besides that, Ganymede's a cesspool. Still, I've got my request in for a position closer to the actual hostilities. If there's going to be a war anyway, I'd rather be fighting than ferrying. No offense, Chris. It's not your fault I have this duty."

They went on to discussing the aliens. Dykstra found Nachteggall less inclined to speak his mind on that topic. "I've met Richard Michaels," Nachteggall said. "You know, the guy that actually ran up against the aliens out in the Oort cloud. They spook me, Chris. I was always taught that there probably weren't many technological civilizations out in the Universe, maybe none besides us. If there were, we'd see some kind of evidence—Dyson spheres, radio signals, something. But we never found anything like that, not in more than a century of looking.

"And then just when the Universe looks empty they show up on Michaels's doorstep and blast their way inside. They don't seem interested in communicating, they don't—aw, hell, you'll just have to talk to Michaels about it. He says they didn't do anything that made any *sense*."

After that Dykstra told the lieutenant about the old days: the Collapse, the excitement of the Moon Rush days, the Belt War of Independence.

But not what it was like to be 126 years old. Dykstra didn't bring it up, and Nachteggall was tactful enough not to ask.

* * *

"Luna City just off to the left, Chris."

"She's so much bigger now. Four more surface domes, dozens of connecting tunnels—the landing field is three times bigger than the last time I was there. I've watched her grow through my telescope back home." Dykstra smiled serenely. In some ways, this was "back home," too.

"We'll be grounding in ten minutes."

Smoothly the boat descended. They flew into the mouth of the artificial cave that was the berthing area for the System Patrol small craft. Nachteggall set them down without a bump.

"All ashore that's going ashore," Nachteggall said.

They left the boat. Dykstra remembered to put his cane out first, using it to help him stand. "I see they still keep System Patrol installations at one gee," he said.

"It keeps the troops in fighting form. You invented artificial gravity, too, right?" Nachteggall said.

"Yes. Paying for it now, though, aren't I?"

The man from the message was waiting. Dykstra recognized the major immediately.

"Professor Dykstra, greetings. I'm Major Moore. Welcome to the Moon."

"Thank you, Major. It's good to be here. But call me 'Doctor.' "

Moore noticed the cane. "What's that?"

"My cane, Major. I have difficulty getting around in full gee fields without assistance. My doctor suggested a cane."

"But it's—a stick. Your doctor gave you a stick?"

"I *made* this stick, Major. I prefer it to a sterile titanium rod." Dykstra watched Moore closely, noting his expressions. Moore hesitated after Dykstra's comment, perhaps afraid he'd irritated the old professor. *He's uncomfortable with me, Dykstra thought. He only knows me by reputation, but now that he's seen me, he doesn't know if I've still got it. Or maybe he's afraid I'm a crazy old coot. We shall see, Major, whether or not I've still got it. We both shall see.*

"We should get you situated in your room, Dr. Dykstra. Take him to his quarters, Lieutenant."

"Yes, sir." Nachteggall carried Dykstra's suitcase and the two proceeded through the vast labyrinth of the High Command complex until they came up to an ordinary door well down the eighth distinct corridor (Dykstra counted) they'd traveled.

"Put your palm on the ID plate, Chris." Dykstra did so. The door opened. "It's keyed to your handprint only," Nachteggall said. "That's not at all common for rooms here. They want you to feel special."

They went inside.

Room. Lots of room. Dykstra's experienced eye picked out the luxury items: the first-class workstation with more computing power than he had at the University; the first-class autochef, capable of preparing any kind of food that an old, delicate constitution might require; and the gravity dial.

Nachtegall went to the control and turned the internal gravity down to half standard. "Is that good enough? If you want, I can kill all the pseudo gravity and you can have Luna standard. But they didn't rig this room for null gee—it'd cause too many problems with the floors above."

"Quite all right, Bob," Dykstra said. "These are unusually nice quarters—how many others are there like it?"

"None. Well, maybe the commander's. I don't know. I've never seen his place. Like I said, they want you to feel special."

"Why?"

"Because the Phinon Project isn't getting anywhere, Chris. Calling you in was the last good idea anyone has had in a month."

"What is the Phinon Project? The aliens? I'm not familiar with the origin of the name."

"It's a cobbled together name. The `phi' part is just the Greek letter. The `non' part is short for `nonsense.' The first nonsense project was called Alpha Nonsense, and so on."

"Why `nonsense' project?"

"System Patrol Intelligence started some speculative projects about twenty years ago. If something comes along that fits with the project, it already has a program to cover it. The nonsense designation came because some of the ideas are pretty far out. The Gamma Nonsense Project was for investigating unlikely advances in energy technologies. The Belt antimatter successes are dealt with under that one. The Phi Nonsense Project was for alien contact. When things heated up, the name got shortened, hence Phinon. Some of the guys are already referring to the aliens as `Phinons.' I suppose it will stick."

"And you say the project is getting nowhere?" Dykstra continued as he took a seat in the comfy chair. The lieutenant sat down opposite him on the couch.

"That's right. I'm not a scientist, but working this close to Major Moore I picked up a lot of things, mainly from having frustrated Ph.D.'s use me as a sounding board. They've had successes, sure. They understand to a dozen decimal places what the alien technology—the weapon and some other things we got back from the Oort cloud—can do. But figuring out how they accomplish these things has remained beyond them."

"I have my work cut out for me," Dykstra said.

"I'd say so." Nachteggall stood, checked the time, and said, "I have to leave now. I'll be back tomorrow morning, say, 0900 hours? I'm supposed to be at your beck and call for the next two days. So if you need me for anything . . ."

"Very well, Bob."

Nachteggall left and Dykstra set the autochef to prepare a meal. While waiting, he checked out the workstation. A few commands assured him he had full access to the Phinon Project files. He found a section on the biology of the aliens that hadn't been included in the cube Moore had sent him. The aliens had steel skeletons, and in place of muscles, they used a system of hydraulics. Dykstra, fascinated, lost himself in the information.

Lunch was forgotten and grew cold.

* * *

"May I come in, Doctor?"

"Certainly, Major Moore." Dykstra led the man to a seat.

"I understand you have something to discuss with me?"

"Names, Major. Among your duties is the recruitment of special talent for the Intelligence branch?"

"Yes. Do you have someone in mind?"

"I have many people in mind. I've been here a week now and I've made a list." Dykstra handed over a printout.

"I don't recognize any of these names," Moore said after scanning the list.

"I didn't expect you to. All of these people are very young, practically just out of graduate school. They haven't had time to make their big marks yet. But I've read their research papers.

"Those names are of individuals who are brilliant." Moore couldn't doubt him. "You should recruit them for the Phinon Project. We'll need them."

"Well, I respect your opinion, Doctor. But some of these disciplines don't fit into what we're doing. This

first one, Samantha MacTavish, genano engineer. How could a genetics and nanotech specialist help us?"

"MacTavish is the biggest prize, Major. The aliens have steel skeletons. Doctor MacTavish is currently involved in genano research aimed at separating iron oxide into its constituent elements using bacteria/virus/nanomachine hybrids. Besides that, she has an exceedingly rare form of intuitive genius. She'll think of lots of things we can't."

Major Moore looked skeptical. Finally, he said, "I'll see what the budget can handle, Doctor. But I won't make any promises."

"Go after Dr. MacTavish first."

Looking annoyed, Moore said, "Right."

Missing the signals, Dykstra pressed on. "If you have any difficulties with the requests, Major, I'm sure I can convince the holders of the purse strings just how badly we need these individuals."

"How's that, Doctor? Is that a veiled suggestion that you'll go over my head if I don't talk to these people?"

He's angry . . . thinks I'm trying to run his show. "Now, Major, that's hardly fair. I've said nothing of the sort. But I did get the impression that you were brushing off my suggestions. That would be terribly unwise," Dykstra said, unconsciously leaving open the question of what he meant by "unwise."

"I'm sorry for the misunderstanding, Doctor." Moore smiled. Barely.

"No harm done. Will you be at my seminar tomorrow, Major? I've made some valuable progress in my week here."

"I'll be there, Doctor."

* * *

Lieutenant Nachteggall was running late, which was evident from the way he tore down the corridors of the High Command on his way to Dykstra's seminar.

"Where's the fire, Lieutenant?" an ensign called after him. He was ignored.

He'd planned to make the seminar in plenty of time. Chris hadn't said what he intended to present, but had made it plain that at least one bombshell was in the offing. Nachteggall wouldn't have missed it for anything.

He'd thought.

The call had come just before he was going to leave, direct from General Hadella, the Czar of Special Operations. He'd gotten a mission! Top secret, very hush-hush. He'd be leaving for the Belt in a week as pilot for a behind-the-lines raid.

He was finally going to get in the war big time.

The seminar was just starting. He slipped through the back door and quietly took a seat. Dykstra, cane in hand as a pointer, was gesturing at some items on the presentation screen that were meaningless to the lieutenant—all mystical symbols and misshapen letters, and here and there an equals sign. Dykstra needed the cane anyway since the gravity in the room wasn't adjustable, but the old scientist was so animated that Nachteggall never saw it touch the floor, except when Dykstra set it aside to deal with some equipment on the table before him.

"Did you follow any of that?" Nachteggall heard one scientist whisper to another.

"Maybe half. Every other letter, I think," came the reply.

"Here we have the alien weapon," Dykstra was saying. The device was mounted on a stand. "You've seen it many times already, and I have many of you to thank for determining a safe method for operating it." He moved down the table to another device, this one unfamiliar to Nachteggall, and considering the murmurings he heard, apparently unfamiliar to all.

"I know some of you wonder about my solitary working methods. I never meant to leave any of you out, but I had a lot of catching up to do, and I do better on my own in such instances." Nachteggall smiled at that. What Chris meant was that he didn't need a lot of dimwits in his way distracting him while he sorted things out. "But I will be working closely with you from now on. I'd like to show you some of the things I've found out."

Dykstra flipped a switch, and a light lit on the unfamiliar apparatus. "This is my attempt to copy the alien weapon." Nachteggall studied the reaction in the room. No one said anything, but there was a change in the atmosphere. A few faces were scowling, perhaps in disbelief that anyone, Dykstra included, could have duplicated the weapon. None of them had been able to do so. Others waited with anticipation, wondering at what the legend had done.

"First, the original," Dykstra said. He tripped the trigger and it bored a neat hole through a three-centimeter-thick block of ceramsteel before terminating in its no longer mysterious way. He returned to his own device. It bored a neat hole also. "Now this in itself is no big deal—X-ray lasers are old hat. But my beam is generated the same way the alien weapon does it."

"You've figured out how it works?!" The exclamation came from down front. "How?"

"How it does it, or how I figured it out?" Dykstra asked.

"Uh . . . both."

"The first question is answered in the report you will be given at the conclusion of the seminar. As for the second . . . well, I invented Dykstra field physics. The aliens have developed some interesting tricks that I never noticed before, but once I saw what they'd done, the pieces fell into place."

"I'm in awe," the scientist by Nachteggall whispered to his neighbor.

"Me, too," the woman replied.

Nachteggall didn't know what to think. He knew he wasn't capable of judging just how incredible a thing it was Dykstra had achieved. He had to settle for judging the reactions of others, people who had a real understanding of what was involved.

So far they seemed amazed, though some faces looked positively dour.

"Doctor Dykstra?" A young engineer stood up.

"Yes, Dr. Vander Kam?"

The man looked surprised. "You know who I am? But we've never met."

"You're Rick Vander Kam, heir to the Capitol Products fortune. I worked for your great-grandfather, your grandfather, and even your father. I've also studied your work—you're very talented."

Vander Kam brightened three shades of red.

"You had a question?"

"Yes. I'm almost afraid to ask, but how are you powering your device? I don't see a power conduit or a fusion pack or anything."

Dykstra smiled. Nachteggall could see the triumphant twinkle in his eyes from all the way in back. "Total mass conversion, Dr. Vander Kam. I duplicated that process, too."

"What?" "I don't believe it!" "Most holy shit!" Shocked disbelief. Questions were fired at Dykstra; he answered them simply, still with that twinkle in his eye—he was thoroughly enjoying himself. After five

minutes Nachtegall sorted out the gist of what Dykstra had accomplished:

- 1) He had leapfrogged all the work of the Gamma Nonsense Project, for cheap antimatter production was a trivial spin-off of Dykstra's development, and also now obsolete.
- 2) He had not only deciphered the alien technology, but had duplicated it with terrestrial means right at hand, and all by himself. That really galled some of the gathering.

Nachtegall looked at Major Moore, seated off to the side. The major was not smiling. *Now what's his problem?* Nachtegall wondered. He knew Moore hadn't wanted Dykstra to be given the star treatment, had felt that it might interfere with his authority, and had been overruled. Now Dykstra had managed to outshine even the brightest of the early hopes for what he might accomplish.

Dykstra was tapping his cane on the table. "Quiet, please. Quiet. This seminar is not over yet. I have some other matters to discuss. I need to point out a problem I'm having in understanding the alien design philosophy. It may shed light on the alien thought processes themselves."

The room came to order, though Nachtegall could still see half a dozen conversations continuing in whispers.

Dykstra stood again by his device. "I want to show you one other thing that my copy does." A few changes were made to settings, then the beam reappeared, truncating at eighty centimeters. But instead of a thin cylinder, the beam was now a tight cone, the apex at the point of emergence. Dykstra slid the ceramsteel block against the base of the cone, then backed it away to show the large hole bored through the block. "You see—by allowing the beam to spread, I am now able to make a bigger hole in the block. There are other possible uses for a variable collimation of the beam. I'm sure many of you could think up particularly nasty applications.

"Now here's the rub—the alien weapon can't do this."

There was silence while Dykstra scanned the room, and Nachtegall could almost hear the collective thought of "So, what's your point?"

Vander Kam spoke up. "But even your first duplication attempt has that feature. I gather it isn't difficult to do?"

Dykstra smiled. "Very much correct, Dr. Vander Kam. Adding adjustable beam collimation is altogether trivial. The question is why the aliens didn't do it."

Another older scientist stood up, Dr. Manlinkov, looking like the original Russian bear. He'd begun the seminar with a neutral look that had soured into anger as Dykstra's success became apparent. "Now one damn minute! What the hell does this have to do with anything? Aliens chose not to collimate beam. So

what? We're not in position to question what seems to them reasonable—we know nothing about them. To speculate will be utter waste of time!"

"I see no chains confining you to your seat, Dr. Manlinkov. Perhaps you would like to get back to *your* investigations of the alien technology?"

Nachtegall struggled to keep from laughing. Dykstra had said the words so sincerely, but everyone knew that Manlinkov had been working on the alien power supply, and getting nowhere, for months. He was just being petty.

"Hmph!" Manlinkov said, and sat down.

Dykstra continued. "I think what Dr. Manlinkov is concerned about is that the aliens' failure to add adjustable collimation may be like our reasons for not making every shotgun double-barreled.

"I am convinced that there's more to it than that.

"Suppose you were wandering the old West and you found what you thought was a six-shooter. Upon closer inspection, you discover that the cylinder has only one chamber drilled in it. Now, the cylinder is able to rotate, and there is ample room for five more chambers, and everything works exactly as a six-shooter should, except for that deficit in the number of chambers.

"Clearly, adding five more chambers would make the gun a better weapon. So why didn't the maker do it? Did he have some powerful reason for boring only one chamber? Or did it simply never occur to him to bore five more?"

"That doesn't make sense," Major Moore called out. "How could anyone who could make the gun in the first place be so stupid as to miss something like that?"

"I don't know," Dykstra said. "But consider this: Dr. Manlinkov mentioned that the aliens chose not to add the variable collimation feature. Perhaps there was no choice involved at all."

* * *

"I don't know where I'm going, Chris," Nachtegall said. "They gave me the coordinates to some anonymous rock no one's ever heard of—but no indication about what we're supposed to do there." They were sitting in Dykstra's living room a day after the seminar.

"Did you meet any of your team yet?"

"Yes. Four are cybernetically enhanced commandos. The commander, Captain Reynolds, is made of

some very fine steel indeed. The two other team members are medical doctors."

"Really?" Dykstra said, curious. "Do you recall their names?"

"Oh, boy, let me think. One had curly blonde hair . . . Mary Beth Doelder, a surgeon. The other one, Diane something . . . Joseph? No, Joswick. Diane Joswick."

"She's not a surgeon," Dykstra said.

"No. A psychiatrist. You've heard of her?"

"Yes. She's *the* name in autism research."

"Then what's she doing in the Patrol?"

Dykstra shrugged.

"The whole thing is goofy," Nachteggall said. "But at least it's a real mission."

"Courier days finished, Bob?"

"Nope. I'll be back with Moore in a few weeks."

Dykstra smiled. He looked good, Nachteggall thought. Relaxed, at peace, enjoying himself. And more. He looked like a man at the peak of his powers, and wise enough to know and relish it.

Dykstra was gesturing with his cane. "This mission is a puzzle. Let's figure it out. You were chosen as pilot because you're already familiar with both the Phinon Project and the Belt antimatter investigations?"

"Yeah. And I'm a damn good pilot, too."

"I wasn't implying otherwise. And I'm beginning to get an idea. Have you seen your ship yet?"

"A Capitol Products Streakbomber. Oversized engines, but no bomb payload. It looks like we'll be going in fast and coming out fast. But without bombs we're not going on a secret demolition mission."

"You also wouldn't be bringing along Joswick," Dykstra said.

"So? What? We're going to steal something? Or someone?"

"That's my guess," Dykstra said. "You're going in to kidnap someone from the Belt. Someone who is very valuable to them, or to us, or perhaps to both."

The lieutenant went to fix himself a drink, also drawing a coffee refill for Dykstra. "Any idea who?" Nachteggall asked, resuming his seat.

"The man responsible for the Belt antimatter successes. I can think of only one person who could have sorted it out. He lives in the Belt."

"Who?"

"Arie Hague."

"Hey! I've heard of him. He's the guy that found that—"

Dykstra cut him off. "Found that mistake in the Dykstra gravity equations. I've been hearing about that for twenty years. The fact that it wasn't a mistake he found doesn't change the perception on the part of the public . . . or my colleagues, for that matter."

"You disagree?"

Dykstra took a deep breath. "No point in letting myself get worked up about it all over again," he said. "What Hague found was a discontinuity in the full five-dimensional expression of my gravity equations. I knew it was there. I ignored it because it was physically irrelevant. It still seems that way—Hague never has demonstrated any reason why the discontinuity shouldn't just be ignored." His tone lightened. "Still, to have even found it . . .

"Oh, well, this is beside the point. In my judgment, Arie Hague is the one person beside myself who I'm certain understands the physics involved well enough to have invented the Belt antimatter process."

"So, we're going to kidnap Arie Hague?"

"Yes, but what's the justification? Why are you kidnapping him?"

"Hell, that's easy. If he's all you say he is, then just taking him away from the Belt is enough reason. Besides, once he's here, we might be able to bribe or coerce him into working for us. We've already seen what one super genius can do," Nachteggall added, grinning.

"There's one other reason you probably haven't heard about yet. If it's Hague, I think I know what he'll be working on here, provided we can get him to do it."

"What?"

"The alien faster-than-light drive. If it exists, that is."

Nachtegall's eyes went wide. "I *have* heard some things. But most of the other technogeeks, I mean, scientists, don't believe the aliens have one."

"And not without good reason," Dykstra said. "A few months ago I would have agreed that FTL drives are an impossibility."

"And now?"

Dykstra sat solemnly, his cane still waving unconsciously in front of him. "Lately I've seen too many new tricks in my physics. Maybe it can be done. One thing I do know, if the discontinuity Hague rediscovered does have physical significance, then the possibility of FTL travel is assured. That's one reason why I ignored it in the first place."

"Oh, geez, look at the time," Nachtegall said, rising abruptly. "Sorry, Chris, but I gotta get out of here. I have to be somewhere in ten minutes."

Dykstra rose also. "Another meeting?"

"A date," the lieutenant said. "It isn't every day a brave man goes off on a secret mission he may never return from."

Dykstra laughed.

"I guess we figured it all out," Nachtegall said.

"Not all of it," Dykstra said. "What's the psychiatrist for?"

* * *

The week following the lieutenant's departure brought no direct word on the success of his mission. Dykstra, concerned for the safety of his friend, kept his ear to the ground for any news out of the "spook camp," that subdivision of Patrol Intelligence devoted to using any means possible to gather information on the enemy. He caught excited whispers about a successful Patrol raiding mission. The smug smile on the face of General Hadella confirmed that something had gone very well recently in Special Operations.

Dykstra's professional work moved along. He was handed the task of designing a power system and spacecraft drive centered on his mass conversion technology. In the process he gained a helper and

disciple—Rick Vander Kam.

"Any additional news on the lieutenant, Chris?" Dykstra heard immediately upon entering the lab.

"Not yet, Rick. Bob's only been gone a week. But I did overhear General Hadella mention something about a big surprise and good news for the 'alien technology boys.' I assume Nachtegall's return will coincide with the release of that other information."

"So Bob will be back in a day or two?"

"I hope so."

Designing a power system based on mass conversion technology was easy. Designing one that was useful for the military was a different matter. Though Dykstra was both a brilliant theorist and experimentalist, he had seldom had to do the sort of intensive detail work that turned a brilliant demonstration experiment into a great product. But that was Vander Kam's forte. Dykstra was routinely impressed by the younger scientist's deftness at both finding necessary equipment already on the market and designing things that would meet their unique needs.

The morning proceeded without unusual incident, but while they were at lunch, general quarters sounded.

"Whoa! Wonder what's up?" Rick exclaimed.

"I'm sure we'll soon know. But let's go to the tracking room," Dykstra said.

The tracking room was a broken anthill of activity, with orders being shouted and relayed, and the data display being continuously updated. The big screen told most of the story, with the chatter providing the sound track.

"One raider. That's all I see!" "I check that." "Velocity three thousand twenty-six kilometers per second." "Course?" "Flyover of the North American west coast. I'd say California." "He'll be there in ninety-five seconds." "Still no other tracks?" "Negative. He's running this thing alone."

Dykstra and Vander Kam watched with rapt attention from the railing. Dykstra had not missed the reference to California, but revealed his concern only in a soft, unconscious tapping of his cane against the floor.

"Demon Chaser missiles away!" "They won't catch him." "Sure they will—in an hour or so." "Earth's laser batteries will fry him before then." "Maybe."

"Does any of this make sense to you, Chris?" Rick asked.

"My guess is that this is a limited raid with narrow objectives. But I don't know what those might be."

"Uh oh. He's dropped three missiles." "Got it. Twenty seconds to impact. Initial track puts all of them in California." "The raider is blasting off-vector. Evasive maneuvers." "He's finished what he came here to do."

Dykstra and Vander Kam were watching the screen when it displayed California and three circles representing the missile impact sites. Dykstra let out a gasp.

"What's the matter, Chris?"

"I'm from California, Rick."

"Are you familiar with the areas hit?"

"Intimately. My home is on the west side of the Sierra Nevada."

"Near the impacts?"

"Under them."

They stayed a while longer. The view of California expanded to show the impact areas in detail. The warheads had leveled and incinerated hundreds of square kilometers of lakes and streams, fields and forests, and at least one house—Dykstra's house.

"Dr. James Christian Dykstra, report to Major Moore," came over the PA.

Dykstra set off with heavy footsteps, leaning greatly on his cane.

* * *

Alone in his suite, lights dimmed, Dykstra brooded.

He'd lived in the house one year short of a century. He remembered the parties, the late nights spent talking to the brightest lights of the 21st century—scientists, authors, entertainers, and politicians. He relived that last chess game with his best friend, Jamie. He shed a tear over the image of Jennifer, saying good-bye to him from her deathbed.

His collection of rare chess sets was gone forever, all three hundred. His music collection now just

random atoms.

Priceless works of art, gifts from admirers and friends, now just vapor.

Their monetary value was meaningless. Their sentimental value, incalculable.

But what he most regretted losing were the letters—hundreds of letters written to him over a period of seven decades—from Jennifer.

They'd been together since before the Collapse. She'd loved him. At first it was a love he wouldn't return, not the way she wanted. After a while, that had ceased to matter.

Their souls had been linked. Jennifer had told him he'd been placed on the Earth for a purpose, and that she had been placed there to be beside him, and that's all that mattered.

Her letters had been a comfort whenever she was away. After her death, he'd often pulled them out just to look at them, and relive precious moments.

Gone. All gone.

He cried.

* * *

Dykstra was awake by four in the morning. He didn't get up, though. He felt old. He rolled over and pulled the pillow under his face. Too warm, he pushed the covers away. Too cold, he drew them back.

Nothing helped—he was just a tired old man, unable to sleep.

Images still played through his mind, as they had earlier—scenes from the tracking room, the meeting with Moore, and even of himself, crying pathetically.

He slipped away again.

He was jolted awake by the door buzzer.

"Huh? What? Oh, good lord, Richard Michaels was coming this morning." The clock said 8:01. Despite the turmoil of the previous day, he kept the man waiting only an additional two minutes.

"Enter," Dykstra said as he left the bedroom.

The door slid open and a boyish young man entered, and stumbled, but caught himself before going over altogether. "Oh, I'm sorry, Mr. Michaels. The gravity is half standard in my rooms. I should have warned you."

"That's all right," Michaels said, gathering his composure. "I've been through a lot worse recently."

"Where have they been keeping you, Mr. Michaels?" Dykstra asked.

"I've been down Earthside, visiting VIPs at the regional capitols. They all want to hear about the aliens firsthand."

"I see," Dykstra said. "I wanted to meet with you because I need to understand the aliens better. Some aspects of their technology mystify me. Perhaps you can give me some insights into their personalities."

"I'll do my best," Michaels said.

"But first, one of the things we've been doing is trying to determine whether or not the aliens have FTL travel—"

"They must," Michaels interrupted. "First there wasn't anything on the scanners, including the Dykdar, and then there was. The ship just popped in out of nowhere. What else could it be?"

"It could be FTL, true. But it could also be advanced stealth technology, even against Dykstra wave scanning."

"I thought that was impossible."

"So is FTL. Or so I thought. I've seen enough 'impossible' things in the past month to make me leery of that word. But apart from stealth, they might also have come in at very near to lightspeed, say ninety-nine point nine percent, then done the equivalent of a quantum transition to a lower velocity state. It would look much the same as a magical transition from FTL to sublight."

"Quantum velocity states?" Michaels looked bewildered.

"A speculative technology that didn't pan out in the details. But the point is, there are lots of possibilities to explain what you saw that don't require FTL drive. Unfortunately, your memory is the only record we have of the event—we never could get the data out of your ship's log."

"Tell me, Dr. Dykstra, do you think they really have FTL drive, or will it turn out to be one of the less exciting possibilities?"

"Before I answer, first tell me if you're familiar with the work of Arie Hague."

"Hague? Isn't he the one who rediscovered the discontinuity in the full expression of your gravity equations?"

Dykstra laughed at the man's diplomacy. "You phrased that *just* right. Well, for our sun, the gravity equations theoretically break down on a shell roughly fifty-seven point four astronomical units in radius. It's called the Hague Limit. I've always believed that the limit has no physical meaning, mainly because it implies the possibility of FTL travel and thus the usual causality paradoxes.

"So to answer your question, if the aliens do have FTL travel, then Hague is right and I was wrong to ignore the discontinuity. For reasons of professional pride, I'd like to say that I don't believe in an alien FTL drive."

"I sense a `but' in there," Michaels said.

"*But . . .*" Dykstra said, "to use an expression one of my old college friends was fond of, FTL travel would be `nifty as tits.' "

They both laughed. "So . . ." Michaels finally said, "your bottom line is that you just don't know."

"Correct. However, I am sure of one thing, and I don't know if even Hague has figured this out yet. But if the aliens do have FTL drive, then they can't use it inside the Hague Limit. The physics of why that must be so is a little hairy, but I'm certain of it."

Dykstra asked Michaels what he wanted to drink, then discovered the man hadn't had breakfast, and set the autochef to preparing a suitable repast. After a swig of orange juice to wash down his last bit of toast, Dykstra said, "But how did you *feel* when you first encountered the aliens? I mean, what was your impression of them, apart from the situation?"

"I happen to be one of those people who can't abide spiders. Ants, beetles, other bugs don't bother me," Michaels said. "But spiders . . . I think Satan himself invented spiders."

Dykstra listened. He'd had a pet tarantula that must be crispy critters now, but he didn't mention it. Michaels obviously hadn't been told of his recent loss.

Michaels continued. "After the aliens blasted their way in, I got a good look at them when they came into the corridor. The backward bending elbows and knees were funky enough, but what struck me wasn't the way they looked. It was that I felt like I was up against big spiders, things that were so utterly different" He trailed off.

"You're stuck because you were going to say they were so utterly alien, and that's a bit redundant,"

Dykstra said.

"Right. I mean, put me in a corral with a horse, or a cow, or even in a zoo with an elephant, and there's still this sense of common ground. I can empathize with an animal. Even dolphins, and they come from an entirely different environment.

"But the aliens were like spiders—who can empathize with a spider? They walked on two feet, they had technology, they flew spaceships. But as they stalked my ship, when I was killing that one, even when the other one ran away like a bat out of hell, it just didn't feel like humans have anything in common with them at all.

"I know this is subjective—"

"That's all right," Dykstra said. "I'm finding this very valuable. There are aspects to their technology that make me feel much the same way that you're describing."

Michaels sat quietly for a minute, just staring at the wall. "Dr. Dykstra, you're a religious man, right? I seem to remember something from your biography about you and the Calvinist Reformed Church."

More memories flooded Dykstra's mind, most pleasant, some unwelcome. Whole chapters of his life had been devoted to that church. The story of his life made a very long book. "Yes, I'm a religious man."

"I'm not," Michaels said. "I'm a lazy agnostic. I was always just live and let live on the subject."

"Have the aliens affected your thinking?"

"Maybe. Because the best way I can think of to describe them involves a religious idea."

"That being?"

"The soul, Dr. Dykstra. I'm not much of a philosopher, let alone a theologian. But as the only man who's actually met the aliens face to face, I think I have a right to an opinion. And I don't think the aliens have souls."

* * *

Nachtegall's left hand was bandaged, and tubes ran into the dressing from a portable med unit strapped around his arm. "What happened to your hand?" Dykstra asked. The lieutenant, sitting on Dykstra's couch, had gotten in late yesterday.

"The original is somewhere in the Belt. This one," he raised the globe of bandage, "is a cloned

replacement they attached last night. I'll be good as new in a few days."

"How did you lose it?"

"Getting Hague out of that dungeon they had him in. All right, so it wasn't a dungeon, but I don't think he could come and go as he pleased." Nachteggall got a strange look on his face. "Not that *he* ever would have wanted to. Have you met him yet?"

"Major Moore said Hague would be in my lab early this afternoon. The med teams aren't finished with him yet." Then: "It was rough, wasn't it?"

Nachteggall's shoulders sank. He cradled his new hand in his lap. "Yeah, Chris. It was rough. We lost almost everybody. That's all I can tell you. But if Hague really is their best brain, they'll be readying some kind of retaliation. And they're going to be pissed about what I did to that laboratory station."

Dykstra gave Nachteggall a sardonic smile. "They've already retaliated," he said. "*Lex talionis*. A few days ago they hit California with fusion bombs. My house was under them."

"What?"

"They don't know I'm on the Moon, I guess. We deprived them of their mad scientist. They wanted to deprive us of ours."

"I'm sorry, Chris. You loved that place."

Dykstra stood up. "There's a war on. We don't have time for sentimentality. At least I don't—not at my age. Now, tell me about Hague."

Nachteggall frowned. "Moore won't let me. He was specific."

"Oh?"

* * *

Dykstra arrived at his lab to find Vander Kam already there with Major Moore and another man. He assumed it was Hague, but he'd never seen any pictures of the man. Judging by the man's appearance, he now knew why.

"Dr. Dykstra," Moore said. "I'd like you to meet your new colleague, Dr. Arie Hague. Dr. Hague, this is Dr. James Christian Dykstra."

"Pleased to meet you," Dykstra said, extending his hand.

Hague took Dykstra's hand limply. "Yes, Dr. Dykstra, Dr. Dykstra, yes, yes, Dr. Dykstra." Hague was short and chubby, with soft muscles and a pinched face surrounding an undersized, pointy nose. "Yes, wonderful lab, wonderful lab, Dr. Dykstra, yes." He was nodding his head and smiling and seemed to have forgotten that he was still clasping Dykstra's hand.

Dykstra looked him over. So this was his rival, the man responsible for the only controversy to arise from his work. *An autistic savant. Incredibly deep talents but so narrowly focused. Now I know how he could plunge so far into my physics, and still remain so unknown outside the discipline. They kept him under wraps.* "Have you shown Dr. Hague our facilities yet, Rick?"

"Just briefly," Vander Kam said. "He'd really like to look over our mass converter, I think." Vander Kam had already referred to Hague in the third person, as if he weren't there. It was easy to do. Hague didn't notice.

Dykstra disengaged his hand. "Shall we have a look at our current project, Dr. Hague?" he said, leading the squat prodigy over to the table on which the gear was spread.

Major Moore waved from the door and made his exit, smiling, as if pleased with himself.

"Oh yes, Dr. Dykstra. The equipment, the equipment, yes, the work. Let us examine the work, Dr. Dykstra, yes."

Dykstra explained the theoretical details of the mass conversion process and Vander Kam covered specific items dealing with the device itself. Hague was a good listener except for his maddening habit of muttering, "Yes, oh yes, Dr. Dykstra, very good, yes," after every other sentence.

It was when Rick was discussing the specifics of the power control unit that Hague showed the first real glimpse of his uncanny talent. "Not right, no, not right, Dr. Vander Kam, no. Not right. Not good. Not this one."

"Why?" Dykstra asked. "What's wrong with that power control?"

"Not right. Not best," Hague said. "Magnoflux Electrics catalog, page 453, entry five, model SQG-100230983-A. Need that one. Yes, need that one, is best, yes, need that one."

Vander Kam looked at Dykstra, shrugged, and called up the entry from the catalog. Dykstra looked at the screen, read the specs, turned to Vander Kam and said, "He's right."

Vander Kam nodded assent. "I know. Damn! I looked through catalogs for three hours just trying to find the one we've got now."

Hague was still at the table. While the other two had been distracted, he'd decided to fiddle with the device. "Hey!" Rick shouted as Hague pulled out a field guide.

"Wrong shape, wrong, all wrong. More curve, yes, curve. Radius of curvature 4.55982 centimeters, 4.55982 needed."

Rick rushed to the table and took the field guide away, then turned to Dykstra and looked at him helplessly.

Hague was jumping up at Vander Kam's hand, trying to retrieve the piece. "Give back, let me fix. I can fix. Please, I can fix, yes, I can fix: 4.55982 centimeters, yes."

"Give it back to him, Rick. Let's see what our new colleague can do." As he said it, he felt the sudden onset of a chill, as if the Sun had gone into eclipse.

* * *

"Dr. Dykstra?" Moore's face filled the screen. Dykstra was in bed, but the red blinking light by the screen had indicated an urgent priority, so he accepted the call.

"Yes, Major? What is it?"

"I'm sorry to awaken you, Doctor. But there's a new file on the system tonight, Slingshot. Look at it immediately. You'll understand what's involved from the technical end and I think you'll want to start dealing with this new information right away."

"Oh, c'mon Major, give me just a little hint," Dykstra said, annoyed.

Moore frowned, looked serious, and said, "The aliens have made another appearance. We learned some new things from this encounter. You of all people should look into it right away." Then with an expression Dykstra could best describe as "savage delight," Moore added, "And Dr. Hague, too." He broke off the connection.

Dragging himself from bed, Dykstra instructed the autochef to make him coffee, lightened to a fifty percent concentration of cream, and brought up his workstation. He retrieved the Slingshot file.

Reading rapidly, he discovered the basic facts. Slingshot was the code name for a System Patrol base some sixty astronomical units out. The work there involved investigating methods of delivery for kinetic kill projectiles against Dykstra shielded installations. Dykstra knew better than anyone that the best way to crack a shield was to smack it with something heavy, moving fast. Most of the work involved the use

of close orbits past airless moons and asteroids by warheads that were essentially "rocks" equipped with high gradient pseudograv generators. The rocks were to be introduced into the Belt along carefully determined trajectories, where they'd perform close flybys of asteroids to undetectably pick up speed and alter their vectors, then smash into, as the text put it, "Belt military assets."

Dykstra admired the work, recognizing some of it as inspired, even brilliant; he'd have to check out the Slingshot base roster to see who was responsible.

Details were sketchy, and more information was promised for later, but the base had been hit by two alien spacecraft. They'd come in fast, without warning, and opened fire. The base had taken a beating, but somehow they'd managed to wreck one of the alien ships, and the other had immediately raced away.

Okay, this is all very interesting, but why couldn't it have waited until morning?

He found a cache of raw data from the tracking instruments that had first acquired the incoming alien ships. There was no visual data yet. The base was a wreck. The only information Intelligence had as yet was the text of the messages the acting base commander had sent, and whatever raw instrument data was in shape to transmit.

It took Dykstra only moments to orient himself to the numbers in the data cache. Here were the readings from the spatial position where the alien ships would shortly appear. There: Doppler radar and Dykdar scans indicating two craft, two hundred thousand kilometers out, closing rapidly. The tracking data followed the two vessels up until the moment they destroyed the scanning instruments.

What he saw disturbed him.

"Okay," he muttered. "Let's take a closer look at the time sequence." Time was resolved to the millisecond. At 14:31:46.003 the scans showed nothing. At 14:31:46.004, indications of one object appeared. At 14:31:46.013, a second object appeared, while the first was now a clear image.

But the scanning radius for the Dykdar alone was over five million kilometers. Even incoming at almost lightspeed would have put the ships in the Dykdar scan volume for sixteen seconds prior to their emergence.

But one moment, nothing, one hundredth of a second later, two ships, and both only two hundred thousand clicks out.

"Dear Lord!" Dykstra exclaimed. "They have it. Faster-than-light drive. Hyperdrive, overdrive, ultradrive, warp drive, and everything else the science fiction people have named it. The aliens have it."

But how does it work? I have no idea how it works. It was clear why Moore had called. The major was right; Dykstra was glad to have this information immediately. But something else: Major Moore knew it

would not be wasted on Dykstra that Hague had been right about the discontinuity. And he, wrong. *Spite, Major? Was your call also motivated out of spite?*

No point in being small about it. His second call found Hague in the lab. "Yes, oh yes, Dr. Dykstra, oh yes?" Dykstra told him the news. "Yes, oh yes, Dr. Dykstra, oh yes!"

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II

Sunshine

Samantha MacTavish, as usual after work these days, raced home to her apartment and checked her terminal for mail. The Luna City mail system was excellent, and anything from a serviceman that had reached Luna any time up until a half hour ago should have made it through the military censor machines by now. War or no war, MoonMail guaranteed prompt delivery. Scanning through the listings, she found her latest copy of *The Journal of Genano Engineering*, and a letter from her mom.

But nothing from her husband Steve, out there, somewhere beyond Uranus, or maybe Neptune, serving on a battleship probably, fighting this damnable war against the Belt. "Dammit!" she said aloud. Then softly: "Oh, honey, I miss you."

The last letter had come a week ago, full of feelings, but short on specifics about where he was or what he was doing or when he'd get a chance to come home. She wistfully remembered how they'd gotten together; that stupid stunt he'd pulled as the preeminent suicide orbiteer of Luna City. Steve had bet a System Patrol officer that he could plot a suicide orbit close enough to the lunar surface to allow him to leave a mark on the ground. He'd almost gotten himself killed, had lost the bet in the process, and had thought he'd failed in his greater purpose, which was to impress Samantha enough to notice him. But she already had by then!

But shortly after they'd married, Steve was drafted and sent away.

"Damn war," she said.

Women were not drafted, but she could have enlisted. Her skills in genano engineering were first-rate, good enough to get a top research position on the Martian atmosphere project. She would have been made an officer and been put in charge of a billion-credit research facility, with no end of lucrative opportunities after the war. But she could never get past the fact that war meant people killing other people. She understood about clashing ideologies, and competing economies, and just causes, but none of that excused the evil of an institution that removed souls from their bodies.

In theory she could admit that sometimes circumstances may conspire to make killing an excusable sin. But this war with the Belt didn't make the cut.

And besides, the Patrol had separated her from her husband; she wanted no part of it.

Since she had no letter from Steve, Samantha read the one from her mother. It contained the usual trivial news and pleas to be cheerful, but didn't substantially improve her blue mood. She scanned the table of

contents of the professional journal, found a couple of interesting papers and looked up their abstracts, but her heart just wasn't in her profession right now.

That settled it. She went to the environment controls for her apartment and turned down the Dykstra pseudograv field from the healthy one *g* field to a relaxing one-half *g*. Then she went into the kitchen and made herself a hot fudge sundae, extra nuts and whipped cream, and settled herself in front of the TV. When her sundae was half gone and her mood had shifted up the spectrum to yellow, still short of rosy red, the call signal sounded.

"Accept," she said to the TV, and the daytime drama she'd been watching disappeared to be replaced by a man in a military uniform. A momentary rush of excitement flooded her, thinking it must be Steve, but a split second later her eyes rested on the middle-aged face, and her mood plummeted. She didn't know military insignia worth a damn, but she thought he was a major.

"Yes?" she said, not quite hiding her disappointment.

"Hello. I am Major Gerald Moore of System Patrol Intelligence. Am I speaking with Samantha MacTavish?" the man asked.

"You have her."

"Would you mind activating your viewer so I can see you?"

Oops, she thought. She hadn't intended to be rude. She turned on the viewer.

What the major saw was a strikingly *cute* woman in her late twenties. Although not a classic beauty, Samantha had a twinkle in her eye and a bright, cheerful smile that had earned her the nickname of "Sunshine" long before. But the woman wasn't smiling now.

"Much better, Ms. MacTavish, thank you. I have a matter of some importance I'd like to speak with you about."

"Is it about my husband?"

"Not at all, Ms. MacTavish. Your husband is Ensign Steven Smith, correct?"

"No. It's Steven MacTavish. He changed to my last name when we married, just before he shipped out." From the look on the major's face, Samantha knew he was wondering why Steve had wanted to do that. But it was none of the major's business that Steve loved everything having to do with Scotland, so she didn't continue, but just waited for the major to explain his business.

He went on. "Well, anyway, this matter concerns you and your talents—not your husband's."

"My talents lie in the field of genano engineering. Is that what you're interested in?"

"Yes, Ms. MacTavish."

Her face became hard. "Well, maybe we can get through this pretty quickly. Do you want me to work for the military?"

"We do think you'd be able to help us."

"Major, I might be able to—but I won't. I have no interest in helping you go on with this war. My family is already helping enough."

She reached to end the call when the major said, "Your opposition to the war is well known to me—"

"It is? Why?"

"Ms. MacTavish, I'm afraid I'm the one who got your husband drafted. Finding talent is what I do. I know quite a bit about you. That's why I called."

Samantha took that in stride, said, "Then you know I won't help you with this war."

"I don't want you to help us with the war, Ms. MacTavish. You'd be working for Intelligence, true, but your work won't be at all connected with the war effort."

Now she was puzzled. "I don't understand."

The major continued: "I'd like to help you understand."

He really means it, Samantha thought. Caught between her own curiosity and her disgust with the military, disgust won out. "No. Just forget it. I don't want to work for the military in any capacity." Again she moved to end the call.

"Wait!" Major Moore said. "Let me make a deal with you."

"I'm listening."

"Let me send over a file from the project you'd be involved in. If, after reading the file, you're still not interested, I'll never pester you again." Now he wasn't being a major, just a man trying to keep her attention.

Well, I guess that can't hurt, she thought. "Okay, send the file over. I'm ready to receive."

"I can't do that, Ms. MacTavish. I'll have to have it hand delivered, and we'll have to set up some time where you can guarantee that you will be the only person to accept the delivery."

Samantha couldn't resist. "Oooh, sounds like some really big military secret stuff, huh? Very well. Tomorrow evening at, oh, 1837 hours exactly, no sooner, no later, my apartment. I'll be here then."

He ignored her sarcasm entirely. "My courier will be there at precisely 1837 hours tomorrow evening. Have a nice day." He broke the connection.

She spent the rest of the evening both convincing herself that, no matter what, she wouldn't work for the military, and also wondering just what the hell this file was going to contain.

* * *

She hadn't slept well. It had been one of those nights where you toss and turn and drift from deep sleep to just barely conscious, always pursued by dreams that seem to make perfect sense even as they play the impossible out before your eyes.

In one particular dream, Samantha saw a System Patrol battleship land just outside Luna City, and she thought that was interesting because such ships didn't land, but it didn't bother her. Then the side of the ship opened up and Steve walked out, in shirtsleeves, as the crescent Earth shone over his shoulder, and he said, "Hey, my own sweet Sunshine, when are you going to come and join me?" And as she ran out to join him, Major Moore stuck his head out the door and dragged Steve back, and she was left standing alone as the ship lifted once again for the heavens.

The dream was on her mind as she left for work that morning. She played it back through her head while taking the overland corridor to the science dome. Most of Luna City was underground, but five domes sat on the surface, the caps to very large cylinders that went down a hundred meters, and contained most of the living space. She could have gone the whole way to work via the subsurface transit system, but this morning Samantha preferred to walk through the surface corridor since from it she could see outside. She stopped at one of the windows and gazed out at the sharp, bright surface, the magnificent desolation, and felt a small stab of disappointment; there wasn't a battleship sitting out there.

Once at work, she stopped in her cubicle briefly to turn on her workstation, and then went right into the lab to check on her cultures. Even if her personal life was in disarray, her work for the Martian atmosphere project had been going remarkably well for the past few months.

She peered into the sealed chamber that contained her culture. Inside was a dish filled halfway with Martian surface soil, scooped very carefully right off the Martian desert and returned to Luna

undisturbed. Inhabiting the soil, now, was a very carefully (and ingeniously, her boss would add) tailored virus/bacteria symbiont, designed by Samantha. Observing the monitor, she noted that the free oxygen had gone up since yesterday. She knew that a scan of the soil would show an excess of pure iron. Yes, this bug looked like another success.

The field of genano engineering was only twenty-five years old, but looked like it would finally make good on some of the promises made by the prophets of nanoengineering at the close of the last century. Nanoengineering, dealing with machines measured on scales of a billionth of a meter, had long been hailed as the technological solution to all ills. Diseases would be healed, pollution eliminated, and wealth beyond imagination available to everyone, all provided on the backs of trillions of self-replicating, virus-sized slaves. The promises were still there eighty years later, but the problems of both controlling and powering nanoscopic machinery had proved to be almost ridiculously difficult. Advances were made, but never the critical breakthroughs.

And then in 2071 a genius named Chang genetically reengineered a virus to "operate" a nanoscale tool, and thus the full marriage of genetic engineering and nanoengineering took place.

Samantha was remarkably adept at the new art. Originally, she'd gone to school to be a doctor, but her biology courses had exposed her to the world of research science, a world she found she didn't want to leave. Her excellence got her a full ride to Tokyo University and Chang himself as her advisor. She earned her doctorate by making genano bugs that assembled for her a perfect cube of diamond, ten centimeters on a side. That got her both attention and a job in Luna City at the best laboratory for applied genano engineering in the Solar System, working in the atmosphere division of the Martian Terraforming Project.

And now another of her bugs had come through. This particular strain was designed to separate iron oxide into its constituent elements since the sands of Mars were full of the stuff. Bugs that broke down compounds into elements were nothing special, but this breed would also be able to live, reproduce, and work in the Martian environment with no need for additional care. In her symbiont, the bacteria lived in the Martian soil, and the virus lived on the bacteria, and while so doing, each manufactured and operated nanotools to accomplish its task. And if the iron oxide bug worked, others would follow to break down other molecules, and thicken the Martian atmosphere.

She smiled in delight, the first time this morning that her famous smile showed itself.

"I see you over there, pleased with yourself again, no doubt!" The voice came from behind. It was Martha, fellow researcher, friend, and mother surrogate.

"What?" Samantha said. "I'm just happy for the project."

Martha brought her cushiony self over to the chamber and looked in. "I checked your culture this morning myself. I couldn't wait to see that smile when you showed up." She gave Samantha a hug.

"Thanks, Martha."

"Did you get a letter from Steve yesterday?"

That brought clouds across the sunshine. "No . . . no, I didn't," Samantha said.

"Oh Sammi, I'm sorry. I was so sure you'd hear from him yesterday"

"It's okay, Martha. I'll probably get a letter from him today. It's just that it's been so long."

Martha gave her another hug, compassionate and motherly this time. "I know, honey. I know." She brightened. "Why don't you come over to my place for dinner tonight? Ted always likes it when you visit, and then maybe the three of us can go down to Entertainment Central afterwards."

Samantha thought about it, then remembered her call yesterday. "I'd love to, Martha, but I can't. I got a call from Major somebody yesterday and I promised I'd be at my place tonight when his courier drops a file for me to look at."

"A file on what?"

"I don't know. This major, I think he said his name is Moore, wants me to work for him. I told him I wasn't interested in military work, but he was persistent, so I agreed to look at this file just to get him off my back."

"Didn't you tell him how you feel about the war?"

"That didn't faze him a bit. He even told me he was the one responsible for getting Steve drafted."

"I'm surprised you didn't just cut him off," Martha said.

"I am too. But I admit that I'm kind of curious to know what's in that file he's sending over. Say, why don't I call you after the file gets dropped off, around 1900 or so? If it turns out to be nothing we could still get together."

This was agreed to, and they both got down to work.

* * *

Dinner in front of the TV, alone, with no letter from Steve to cheer her, was a considerably depressing business. A post-dinner sundae failed to help, and Samantha was just about to attempt the last ditch

effort of a hot bath when the door buzzer went off. "Damn . . . that messenger." With a sigh she went to answer the door. A glance at the clock told her it was exactly 1837 hours. She kind of liked having the military kowtow to her orders like that.

At the door stood a handsome young man in a military uniform. She thought he was a lieutenant. She looked again; a *really* handsome young man. That in itself cheered her a little, but she wasn't the sort to find comfort in the arms of another man, so she fought off her desire to flirt and said coldly: "Yes?"

"Ms. MacTavish?"

"The one and only."

"May I come in?"

"No."

"I see. I'm Lieutenant Robert Nachtegall, Major Moore's courier. I have a file for you." Samantha couldn't help but notice Nachtegall's own coldness. Well, she deserved that. She was surprised to see the proffered file was a hard copy. She took the folder from his hands.

"Hard copy? Is the military still in the last century, Lieutenant?" *And why am I being such a bitch?* She wondered. *It's not this guy's fault that Steve didn't write.*

"Hardly, Ms. MacTavish. Major Moore directed me to tell you that this file is for your eyes only, and you are not to discuss the contents with anyone. Ever. Do you understand this?"

The lieutenant's manner, and his statement, knocked all the sarcasm out of her. "It really is that important, huh?"

"It is, Ms. MacTavish."

"All right. I understand the restrictions. When do I need to get this back to you?"

"You don't. That's the reason for the hard copy. Tonight before you go to bed, leave the entire file in your sink. Tomorrow morning you can rinse the residue away. Major Moore will contact you tomorrow. Good evening, Ms. MacTavish." He turned smartly and strode off down the corridor, not waiting for her to acknowledge the end of the conversation.

Samantha took the file to the couch, shut off the TV, which was annoying her with war news, and opened it up.

And she didn't quite get it. The file contained a potpourri of different reports. In addition to twenty pages of close-print text were dozens of photos, many of which looked like cell cross-sections seen under a microscope. There were also lists of composition materials, calculations, and equations that looked like something out of her freshman physics class or her husband's journals, and a brief subsection that referred to three hundred different references ranging over the last century and a half.

The only thing she could immediately recognize as normal in the entire file was a photo of some guy named Richard Michaels, whoever he was.

After her brief survey of the contents, she decided to concentrate on the photos. The first was of a corpse, badly desiccated, of some kind of animal. She read the caption: ALIEN BODY AS FOUND UPON INITIAL BOARDING OF OEV 1. "What is this stuff? Something out of a bad movie?" she muttered. She went through more of the photos. She realized that they showed the "alien" body in various stages of dissection.

She didn't get it. No one believed in aliens anymore. If they existed, they should have been here by now, was how the old argument went. Steve had never believed in BEMs as he called them: bug-eyed monsters. He'd never explained how the term had originated either. Until now she hadn't been interested.

But unless this was some kind of elaborate hoax, what the major had given her was a file on humanity's first contact with an alien species.

She dug into the section on the alien biology.

The call signal went off. It chimed half a dozen times before Samantha recognized it and answered. It was Martha.

"Sammi? What's going on, honey? I was expecting you to call half an hour ago."

"Oh, Martha, I'm sorry. It completely slipped my mind. That file I told you about—the one the major was going to send over. Well, it turned out to be a much bigger deal than I expected, and . . . I guess you shouldn't expect me tonight. I'm going to be busy for quite some time."

"What's in the file, Sammi?"

"I can't tell you that. I'm sworn to secrecy."

Martha was old enough to have been a little girl during the last big war, the Belt War of Independence. Her father had taught her well that sometimes you accept that a secret is a secret and don't pry. She said, "Okay, I understand." Then: "Do you think you might work for the major now?" There was concern in her voice.

Samantha hadn't gotten that far in her thinking yet. She was too fascinated by the file's contents to have considered what she was going to tell Major Moore tomorrow. "I don't know, Martha," she finally answered. "I just don't know."

The biological data was both fascinating and puzzling. Most of what she found was utterly unlike anything she'd encountered before. Since this was an alien, that made sense. But there were also tantalizing similarities. The amino acids and the protein structures were oddly similar to terrestrial life. And the genetic structure of the alien cells was a double helix. "Good Lord," Samantha whispered. "All God's children got the helical stairway." She also noted similarities in the relative chemical abundances of the alien's whole body with that of mammalian bodies, except for the amount of iron; the alien body had a huge amount of iron.

She found the answer to that puzzle in the section on anatomy. The aliens' bones were made of tubular steel, cross-hatched on the inside for great strength. "A steel skeleton. And it's natural. Instead of calcium they build bone out of iron." She couldn't help but realize that her work on the Martian atmosphere project and the abundance of iron in the alien body must have been what had put Major Moore onto the idea of recruiting her. She didn't know why yet, though. There were plenty of other scientists who could work on this, and obviously a great many already had; the reports she was looking at were first-rate.

Other anatomical facts were equally fascinating, but didn't seem to fall into her area of expertise like the iron bit did. The alien didn't have muscles, but a system of hollow tubes and pistons, and several heartlike pumps; the steel skeleton was driven by hydraulics. She also noticed that the elbows and knees bent backwards, unlike a human's.

And the people who had worked on it had failed to come to a consensus on what the alien used for a brain.

Additional reports in the file dealt with alien technology and the whole story of how Intelligence had come into possession of the alien body. Samantha only had time to skim these sections; it had been hours since she'd opened the report, and the paper was starting to disintegrate. She remembered that Nachtgall had told her to put the file in the sink, and very reluctantly she did so, but not before the pages had discolored themselves to the point where she could no longer read them.

That night she lay awake for some time. "Tomorrow I'm going to have to make a big decision," she said to the ceiling. "I don't want to work for the military. But, dammit, I want in on this thing, too."

* * *

The following day in the lab did not go quickly. Her cultures were still doing just fine, and Samantha busied herself most of the day with writing up results and working on a paper. But she found it hard to concentrate as her mind kept drifting to the contents of the secret file.

At one point Martha came over from her work to talk. Wrapped up in her own thoughts, Samantha hadn't even noticed that Martha had failed to greet her earlier, as was her custom. Last night she'd had a stray idea or two that Martha would be angry with her about not coming over, but then decided that was silly.

"So how is our resident genius doing today?" Martha asked. She sounded cheerful enough, but Samantha thought she detected an undercurrent of tension in Martha's manner.

"I'm no genius, Martha. I just work hard and I get lucky."

"Did that file keep you busy all night?"

"Yes, it did. I'm sorry again, Martha. I would have liked to have gone out last night, but . . ." She had been just about to say that the file was timed to disintegrate, so she had to look at it last night, but then Samantha wasn't sure if Major Moore would want her to release that particular fact. *I'm not even working for the military and already I'm censoring what I say, even to my friends*, she thought. She didn't like that one bit. Instead, she said, "I just couldn't pull myself away. And the major wanted me to read all of it last night." That wasn't quite a lie, but it was hardly the truth either.

"That's all right, Sammi," Martha said. "I know what it's like when the military wants you and there's a war on. My dad used to spend half his time telling us kids what kind of questions we couldn't ask him. I won't pry into your secrets." She walked away.

They're not my secrets, Samantha wanted to say. But if she did work for the military, they would be.

By the time she got home she had pretty much made up her mind to tell Moore to go stuff his alien where the Sun didn't shine, but then was disappointed when she found the major hadn't left her any messages during the day. She recognized that she wanted it both ways—to work on the alien, but not be working for the military. *What's the big deal?* she thought. *So it's the military. I wouldn't actually be doing war work. This alien is bigger than my personal feelings.*

She was half done with eating when she realized that she hadn't even noticed that she still hadn't gotten a letter from Steve. By the time she finished eating, she still hadn't gotten a call from the major, either.

At exactly 1837, the call signal went off. She answered.

"Well, I see you have a sense of humor, Major, calling at 1837 hours. Or was it just a coincidence?"

"Why, Ms. MacTavish, I'm sure you know that we in Intelligence don't believe in coincidences." A smile broke out across his face.

"Point made, Major. And I'm sorry for giving you a rough time the last time you called. So where do we go from here?"

"Have you made up your mind to work with us on this project, Ms. MacTavish?"

"Please, call me Samantha," she said. For now, "Sammi" or "Sunshine" were out. "No, I haven't decided yet. I'll admit I'm intrigued. Excited even. But I'm still likely to say no. However, I have decided to let you have a little more time trying to convince me."

"Very well Ms., er, Samantha. Did you make it through the whole file?"

"Actually, no. I got pretty deeply into the technical parts, and I was going to read the synopsis of how you got your hands on the alien, but the report disintegrated before I could do that."

"Sorry about that, Samantha. But most people read the synopsis first—"

"I'm not most people," she said bluntly, interrupting.

"No, that you're not. How much of the story would you like?"

"Just the highlights. I don't want to have too much to forget if I decide not to work for you," she said.

"Okay. About four years ago, the USSSG, that's United Solar System Study Group, sent a probe out deep into the cometary halo . . ." Moore told her the story of Richard Michaels' encounter with the aliens with practiced efficiency.

Samantha was wondering whether or not Michaels had believed in BEMs before his encounter when Moore got to the part where the alien was killed. "He killed it just like that! He didn't try to communicate with it?" She was disgusted.

"The aliens had opened fire on his ship, Samantha. Without warning. Mr. Michaels was afraid for his life. Furthermore, when the aliens boarded, they didn't ask permission—they just blasted their way in, and they didn't give a damn whether or not they killed anyone when they did *that!* Yes, he killed one of them. He tried to kill the other one, too, but it got away!" The coolness of the major's manner had disappeared in the heat of his answer. "I think it would be a good idea if you met him and heard his story firsthand."

"I didn't mean to upset you, Major. I'm sorry. I wasn't there, so I shouldn't question what he did," Samantha said. *And that's as humble as I'm going to get, so you'd better take it,* she thought.

"Right." Down a couple of degrees, but far from cool. "To continue, after that Michaels managed to send

a message back to Earth. The USSSG contacted Intelligence right away—" she *knew* that was a half truth"—and we hushed up the story immediately. Mr. Michaels thought he'd have to wait a few years at least for any possible rescue, but, well, the military has ships that could get him and the alien body back a good deal sooner than that."

Clearly finished, Moore waited for Samantha to comment, or ask another question. She wasn't sure what to say. The story fascinated her. She feared that if she listened to Moore much longer, she really would throw caution, as well as her principles, to the wind and join up. Finally, she said, "Major Moore, I know at least a hundred other biologists who are more competent than I am to work on this . . . what do you call this project anyway?"

"We call it the Phinon Project."

"Odd name."

"Odd project," Moore said.

She figured out that he wasn't going to explain the origin of the name any more than that, so she went on. "What sort of work do you think I might be able to do for Project Phonon that these others can't?"

"That's the Phinon Project," Major Moore corrected, irritated.

"Sorry."

"To answer your question, I don't know what sort of work or what sort of results I expect to get from you. That's not the point. You just happen to be one of the brightest and most talented individuals in the field of genano engineering, and you may be the person we're looking for."

"Looking for for what purpose, Major?"

"To kill the aliens in the event it becomes necessary," he answered bluntly.

"That's what I thought. It isn't enough that we slaughter each other—you want us to take our freak show on the road and slaughter everything else in the Universe, too." She said it as frostily as possible, and expected Moore to recoil.

He went on the offensive instead. "Spare me the melodramatic pacifist nonsense, Ms. MacTavish. The aliens attacked a human ship first, that's a fact. They pose a threat, the full nature of which is not yet certain. But dammit, if we have to fight them we'd better be ready! You're just one of a hundred I've contacted, one of a hundred hypertalented people who might, just might, provide the key to defeating these aliens if they become our enemies. I don't want to go to war with the aliens, Ms. MacTavish. But if we have to, I'd rather we had a chance to win. And if they were to attack tomorrow, we wouldn't!"

Pushed a button there, Samantha thought. "That's a bit melodramatic too, isn't it, Major?" she said.

"Anything having to do with war always is, Samantha." He was actually smiling again.

"Okay, Major Moore," Samantha said, making up her mind. "You haven't gotten me into your little project yet, but I'm willing to admit I see the logic of it. But I still don't know if I want to work for you. Do you have any more things you want to do to try to convince me to join? I'm open to attempts."

Moore paused. He frowned and seemed to be considering what options he had left. *And whether or not I'm worth it*, Samantha thought. "To be honest, Samantha, I'd hoped this call would be enough. If you were anyone other than yourself I'd give up at this point. But someone who has studied your work—he is working for us already—told me to go all out to get you."

Forced *you, I bet*, she thought. "I thought you said you knew about me through my husband?"

"I did. But that isn't what got your name brought up for this project."

Curious, Samantha asked, "Who was it?"

"Dykstra."

"I don't know any Dykstras," Samantha said.

"Dr. James Christian Dykstra, the hypergenius responsible for artificial gravity, defense shields . . . the Dykstra that Dykstra field theory is named after."

Oh—that Dykstra.

"Heard of him?"

"Duh."

"I'd like you to meet him, Samantha. He's on the Moon these days."

She was flabbergasted. Moore wanted her to meet the foremost genius of the 21st century, the man who'd replaced Einstein as the archetypal genius. And he knew about her work. All she could think of to say was, "I thought he was dead."

"He's one hundred twenty-six years old, Samantha. But he hasn't lost anything."

"When?"

"I take that to mean you want to meet him?" Moore confirmed.

"Absolutely. Who wouldn't?"

"Very well. I'll have you brought to our headquarters tomorrow. Can you be ready to go at 1000 hours?"

"Yes."

"I'll have Lieutenant Nachteggall pick you up. I'd also like you to meet with Richard Michaels."

"Okay."

"Have a nice evening, Ms. MacTavish." He signed off.

She knew this would be another night of tossing and turning. But she was also afraid that, after tomorrow, there would be no turning back.

* * *

Since the confirmation of the aliens' FTL capability, Dykstra had thrown himself at the problem of understanding how it must work. The past week and a half had found him sequestered in his apartment, chained to his workstation, reverting to his old form of working alone.

He tried to keep Hague apprised. Now and then he'd call the lab where Hague was continuing the work, with great success, on the mass converter, and discuss various theoretical approaches.

"Ah, yes, yes, Dr. Dykstra, yes, I'll think about that, yes, oh yes," was the typical reply. Once Hague returned a call and reeled off a long string of mathematical expressions. Dykstra was almost certain Hague had made a mistake.

Almost.

He'd torn apart his own preconceptions, restructured his gravity theory all over again, tracked down ingenious, esoteric, and sometimes even goofy ideas in the literature, and tried to synthesize the possibilities into one rigorous whole.

He was still trying when someone showed up at his door. A glance at the clock showed it to be 1930 hours. "Come in," Dykstra said, arising stiffly from his chair. He twisted his neck to work out a kink.

Major Moore entered, uttered preliminary niceties, and got down to business. "This Samantha MacTavish you wanted me to recruit, Doctor—"

"The genano engineer. Have you talked to her?"

"Yes. You're right—she's something special. She's also a tough nut to crack. She doesn't like the military one damn bit."

"A pacifist?"

"It has more to do with her husband being drafted shortly after their marriage."

"I see."

"And I was indirectly responsible for her husband's draft notice. He's an astrophysicist. He was also the best suicide orbiteer on Luna."

"Ah, yes," Dykstra said. "Those fellows who plot close approach trajectories to the surface and then follow them in space suits. A wild hobby." Something occurred to Dykstra. "Close approach orbits, hmm? Did he wind up at Slingshot?"

"That's where we put him. Samantha thinks he's on a battleship," Moore said. "And she'd better not find out different from you."

"How's that, Major?"

Moore frowned. "Let me lay it on the line, Dr. Dykstra. I've been bending over backwards trying to land this woman for us. If it were up to me, I would have given up long ago. But my superiors, because *you* requested her, want me to play the persistent suitor. To do that, I've had to let her in on the existence of the aliens, but she is not cleared for anything else, and that includes where we put her husband—"

"How is he, by the way?" Dykstra interrupted. Moore was getting wound up, and Dykstra didn't like it.

"What? Oh yeah, the base. He's probably fine. We don't have a casualty list yet, but I'd guess most of the fatalities came among the regulars. Ensign MacTavish would have been buttoned up deep inside during the raid, or else zipped away in a lifeboat. Why?"

"Just curious," Dykstra said innocently, but he'd derailed the Major's train of thought.

"Right. Well . . . Ms. MacTavish is going to visit you tomorrow, and you're supposed to convince her of the merits of joining us in our work. She's visiting Richard Michaels in the morning, and she'll be over

here after lunch."

"But I wasn't informed—" Dykstra began to protest.

"I'm informing you now," Moore said, regaining the initiative. "You wanted her, you can help us get her. I'd suggest you look at her file before tomorrow. Good evening, Doctor." He turned abruptly and strode out.

"Okay," Dykstra said to his back.

After the encounter with Moore's obvious hostility, Dykstra found it impossible to return to work. He got dinner; he'd forgotten to eat earlier. Lieutenant Nachteggall came by at 2100 and woke Dykstra up as he dozed listening to music.

Over coffee, Dykstra asked the lieutenant what the major's problem was.

"Major Moore would slice me open from throat to groin and pour in hot coals if he knew I'd told you this. The major didn't want you here. He fought bringing you in right up until he was formally ordered to try."

"But why? Doesn't he think I'm capable? I think I've proved myself," Dykstra said.

"You have. Beyond anyone's wildest dreams. But that only makes it worse. You see, the major is responsible for the scientific personnel here, a whole bunch of guys who are a hell of a lot brighter than he is. Moore is no dummy, even though he was just a peacetime bureaucrat officer, but he knows he doesn't have the brains to go toe to toe with any of the people under him. But he does have authority over them, and he can push them around, and he can always get rid of someone because there're more young geniuses out there to pick from.

"But you're James Christian Dykstra. You're the best. Who can he replace you with? He wanted you to fall flat on your face when you came here. You didn't. He knows there isn't a damn thing he can do about you if you decide to have things your own way, and he doesn't like it."

"Like with Samantha?"

"Yeah. She's a babe-and-a-half, by the way. I met her when I dropped off the data on the alien at her apartment. Anyway, he's sick of trying to lure her in to work for Intelligence, but there you are, you wanted her, and what the Genius wants, the Genius gets."

"But I haven't been unreasonable, have I?"

"No. But you *could* be if you wanted to. Major Moore is a military man. He looks at capabilities, not intentions."

"I assume then that he'd like to have a way to neutralize my supposed advantage. And that explains—" Dykstra began.

"Hague," Nachteggall said. "If Hague works out here—"

"He is working out," Dykstra said.

"Right. If Hague works out, then Moore can look for excuses to send you home. And Hague isn't likely to give him any trouble."

After Nachteggall left, Dykstra called up Samantha MacTavish's file. There were academic records and comments from instructors, some even reaching back to elementary school. *I'll say one thing for Moore—he can be thorough.*

In the personal section, he saw that she preferred to be addressed as Ms. MacTavish rather than Dr. MacTavish. Even though she'd earned her Ph.D. She also most often went by "Sammi," but some of her close friends called her "Sunshine." He looked at her picture, noted the dancing eyes and the shining smile, and understood why.

There was also an extensive section concerning Moore's own personal observations of the candidate, which ranged from neutral to overtly hostile. *He could have limited my access to this stuff. He wanted me to see it.*

The rest of the document contained the evidence of what Dykstra already knew—that Samantha MacTavish was a rare genius indeed.

Closing her file, on a whim, he opened another. *Just what kind of a man would have been confident enough to marry a supernova like you,* he thought. He looked into the Slingshot file under Ensign MacTavish, Steven J. All he found there was a link to another file, that of Ensign Smith, Steven J. Samantha's husband had taken her maiden name as his own. There was no explanation why, though Dykstra guessed that perhaps Steve had wanted a name less common than "Smith." At any rate, it revealed a secure man.

The rest of the document revealed much more.

Steve was the solar champion suicide orbiteer, having once taken a plunge that zipped him past the lunar surface close enough to leave a mark. He was the man responsible for the brilliant work Dykstra had noticed in the Slingshot file. *I see you married an equal, Samantha. I'm impressed.*

* * *

Lieutenant Nachteggall arrived at Samantha MacTavish's door at exactly 1000 Saturday morning. He recalled their first meeting. She'd been cold and wouldn't even invite him in. Too bad, too. She was something to look at.

The door opened. Samantha was stylishly dressed, wearing a loose blouse and mid-thigh skirt. Nachteggall took in the pleasing curves of her body without once letting his eyes drop from her face. "Hello, Lieutenant." She smiled, a sunrise on a frosty morning. "You're right on time."

"Major Moore insists on it," he said. He led her up topside to the landing berths and they set out across Mare Crisium in the military courier boat. There wasn't a trace of her earlier hostility, though she seemed edgy, drumming her fingers on the armrest.

"Are you nervous, Ms. MacTavish?"

"Yes I am," she said without hesitation. "Have you ever met Dr. Dykstra?"

"Yes."

"What's he like? I mean, does he *seem* like a legend when you're with him?"

"So that's it," Nachteggall laughed. "You have nothing to worry about. His genius does live up to its legendary billing, but when you're with him you'll just think he's a sweet old man."

Nachteggall's words seemed to settle her. After a bit she said, "Lieutenant, can I ask you a question?"

"Call me Bob, please, Ms. MacTavish."

"Okay. Call me Samantha."

"Done. And yes, you can ask me a question if I get to have one in return."

"Fair enough. I don't know quite how to ask this, but . . . did you think I was a bitch that first time you stopped by?"

Yes I did, Nachteggall thought. "I thought you were rather cold, Samantha. But I didn't take it personally. Major Moore had warned me that you weren't fond of the military."

"I'm not. But that doesn't excuse my behavior. I'm sorry I didn't even let you in the door."

"Apology accepted," Nachttegall said. "Now my question: Why don't you like to be called `Doctor'?"

"It makes me feel *old*."

"That's it?"

"Lieutenant, do I *look* like a Dr. MacTavish?"

They landed at the High Command and the lieutenant led Samantha through the labyrinth.

He left her alone in an office, but waited outside the door for Moore. Moore arrived and went in to talk with Samantha, emerging soon thereafter with a disgusted look on his face. Richard Michaels came, and Nachttegall was directed to wait outside until Michaels and MacTavish were finished.

"Damn guard duty," Nachttegall muttered. He dozed in a chair until his subconscious notified him that an hour had passed and it was time to take Samantha to lunch.

"So what did you think of Richard Michaels?" Nachttegall asked Samantha as they sat eating.

"He's a nice guy," she said. "Haunted, though. I guess being forced to kill will do that to a person. And considering what the first thing was he killed . . ."

"Yeah. That'll sober a guy up."

"One thing he said really sticks with me," she continued.

"What's that?"

"He said, `I don't think that morally, ethically, maybe philosophically, that we have anything in common with them.' Weird."

They went to Dykstra's apartment. Samantha was nervous again. Nachttegall felt sorry for leaving her there at the door. But she'd be okay—Chris would take good care of her.

* * *

Standing outside Dykstra's door, Samantha gathered her courage. What do you say to a legend anyway?

She'd read Dykstra's biography in school, and she tried to remember some of it. She'd never forgotten the opening line: "There are geniuses, and then there are geniuses, and then there's Dykstra." But she was bothered that Dykstra had agreed to work for Major Moore, had agreed to work on a project that

had as its objective the designing of means to kill the aliens. Could that ever be right? It just didn't jibe with her view of what a great, kind genius should be involved in. It wasn't the Dykstra she knew from the book.

But maybe he was seduced in, just like they're trying to do with me.

I guess I'd better buzz or knock, she thought. Waiting wouldn't make things any easier. She assured herself there was nothing to be afraid of.

Nevertheless, he was a legend.

She pressed the buzzer. The door opened. A pleasant voice said, "Come in, Mrs. MacTavish. Watch your step—the gravity is lower in here."

Samantha entered, and the pseudograv field left her feeling only half as heavy as a footstep ago. *We share a minor indulgence*, she thought. Sitting in the middle of the room in the comfy chair was the old man himself, looking like a well preserved seventy. For a moment, she doubted he could be Dykstra at all. But he arose and said, "Hello. I'm James Christian Dykstra. My friends call me Chris. You may call me whatever you feel most comfortable with."

"I'd probably be most comfortable with Dr. Dykstra," she said.

He smiled at that, a soft smile. He looked at her, eyes twinkling, crystal clear, and infinitely penetrating. "As you wish," he said.

"But you can call me Samantha."

And after that Samantha didn't have a clue as to how to begin. Fortunately, Dykstra did.

"We *will* have to fight them, you know," he began. "Now that we're able to get out to the Oort cloud we've become a threat to them."

"But I don't understand why it has to be that way," Samantha replied. "Space is so big. Why can't we just leave each other alone?" She stopped; she was arguing with the foremost genius of the age.

He was grinning. "Very good, Samantha! I thought if I made a blunt statement you'd forget about being intimidated by my reputation and just say what you thought. I'm counting on you to continue to do so." There was a gentleness to his manner, and yet a certainty in the way he spoke, that both put her at ease and increased her already immense respect for the man. It was obvious that, despite his unique genius, he had no shred of egomania.

"So you don't think we'll have to fight them after all?"

"No. We *will* have to fight them, I believe. I said that I was blunt, not that I was kidding."

"Your reasons?"

"First, why don't you take a seat, Samantha. I hope you don't mind the gravity, but my doctor insists that at my age, well, I think you understand." She sat on the couch and he back in his comfy chair. "Now, as for my reasons, I'm sure Mr. Michaels told you that he thinks the aliens are all through the cometary halo. It's hardly likely that there was only one ship, or that he'd find them almost immediately upon arriving in the cloud."

"He told me that," Samantha said. "But even if they do occupy the halo, what difference do we make to them? We like it close in to the Sun, and for all practical purposes, they're living in interstellar space. Do we even have anything they want? And if we do, why haven't they attacked us a long time ago?"

"Your points are well taken, Samantha. It's not at all unlikely that the cometary halos of nearby stars overlap each other. The aliens could very well be a true interstellar race, living only between the stars. At least now." He paused for effect. "But what did they used to be?"

Samantha thought about it for a second, said, "They must have evolved on a planet—their physical structure allows no other conclusion. But that doesn't mean they're interested in stars now."

"But they might be. The prudent military man must consider that," Dykstra said.

"I almost forgot you're working for them, Doctor."

"You need not fear me trying to verbally coerce you into joining, Samantha. I'm genuinely interested in your opinions."

"Why? I'm barely out of school," Samantha said, protesting, yet glowing inside. And she knew he was being honest.

"I'll get to that. But let me remind you that I was still *in* school when I first formulated the Dykstra field equations."

"I recall reading that."

"Another factor I've considered is the way they behaved when they first came upon OEV 1. We have two things to consider. The aliens have either encountered other intelligent life before us, or they have not. Assuming the two who met Michaels were representative of the race as a whole—"

"Then in either case," Samantha interrupted, "it would make them xenophobes."

"You've got it. And there is one other thing. I'm sure Richard Michaels conveyed to you his visceral impression of them?"

Samantha recalled what Michaels had said. "He did, yes. He was quite disturbed by it, I thought."

"Are you a religious woman, Samantha?" Dykstra asked.

Puzzled, she said, "Sure. I believe in God and heaven, and I go to church. Er, now and then. Steve, my husband, is the more religious of the two of us, though. Why do you ask?"

"You believe you have a soul?"

"Yes. And Michaels thinks he didn't sense any common ground because the aliens don't."

"Yes. You are delightfully quick, Samantha," Dykstra said, smiling.

"Call me Sammi now," she said. She liked this old, brilliant man.

"May I be so bold as to throw in an occasional `Sunshine'? I see how you got the nickname."

"I'd be honored . . . Chris."

"To answer your questions, I think it's possible that the aliens have no souls. But I have no idea how you go about proving something like that. The whole thing scares me." Dykstra got up then and brought them refreshments from the kitchen.

Looking at the clock, Dykstra said, "I see we're almost out of time. I have a meeting in ten minutes. Let me tell you a couple of other things.

"It's entirely possible that the aliens' faster-than-light drive—we're certain that they do have one—won't work deep in a gravity well. Perhaps they've left us alone up until now because they can't keep the advantage of FTL travel near the Sun. A scientist named Arie Hague pointed out that for any spherical gravitating body there's one unique distance from the center where my field equations don't seem to work at all. A discontinuity. It's called the Hague Limit. For years people have wondered, myself included, if the discontinuity had any physical implications. It's my intuition that the alien FTL drive doesn't work inside the Hague radius, which for our Sun is about 57.4 astronomical units."

"But Chris, aren't they so far ahead of us technologically that it wouldn't *matter* whether or not they could use their FTL drive? I mean, aren't they *way* ahead of us?"

"You know, you're only the second person who has spotted that objection without having it pointed out. And it makes perfect sense, except that I have examined some of their devices—"

"Like what?"

"You'll have to sign up before I'll tell you that," Dykstra said.

"I see."

"Anyway, they are not *that* far ahead of us." To her, he looked a little puzzled by that, even as he spoke, and he seemed distracted. "In fact, I saw a couple of obvious inefficiencies in one of the devices . . ." But then he trailed off and wouldn't continue.

He didn't seem like he was going to start the conversation again, so Samantha said, "Before I go you said you'd tell me why you wanted the major to get me on the project?"

Dykstra came back from wherever his mind was trekking. "Oh, I'm sorry, Sunshine. Forgive an old man for absentmindedness. The reason I want you for the project is that, of the other genano engineers I've seen, you have the most obvious intuitive genius."

"I'm not a genius," Samantha protested. "I'm good, but Chang is—"

"You're better than Chang, Sammi. Even he says so."

"But—"

"Trust me on this one, Samantha. I'm the smartest man in the world, remember? I recognize the exceptional genius when I see it."

"Well . . . thank you," was all she could say. And though she denied it, she knew what Dykstra meant. She had always had a good *feel* for how to solve a problem, for which approaches made sense and which didn't, and hadn't realized until grad school that the level of her talent was virtually unique.

There was a buzz at the door. Nachtgall had arrived to take her home. She said good-bye to Dykstra, but she knew she'd had more than just a unique encounter with a legend—she'd found a new friend.

And . . . something more. But she couldn't quite put her finger on it.

* * *

If the Sunshine Bob had left at the door had suffered from cloudy skies, the girl he flew back to Luna City was as bright as a crisp, clear, Rocky Mountain afternoon.

"Oh, Bob! He was everything you said he was, and more. He was so kind, and down to earth, and *brilliant!* And there I was, talking to the legend, and . . . and . . ."

"Holding your own?"

"*Yes!* He treated me like an equal. And I think he liked me, apart from my abilities, I think he liked me as a person." Her smile lit the interior of the shuttle, and dispelled the shadows outside.

"I get the picture," Nachtegall said. Dykstra was something else. Even at his age, he could still charm the young ladies. The lieutenant wished Samantha would gush about him that way.

Later, Nachtegall reported to Moore the bare details of Samantha's visit. The major wasn't interested in hearing more. Then Bob went to Dykstra's to see what the old professor's view was of Sunshine.

"What a thoroughly *delightful* woman," Dykstra said. "And what an appropriate nickname. 'Sunshine'—it's obvious how she got it."

"She was thoroughly impressed with you, too, Chris. She gushed all the way back to Luna City, pleased as hell that you treated her like an equal."

"She deserves that kind of respect. She has the gift, or the spark, call it what you will. She's better than or equal to any of the others Moore has gathered here. But I couldn't convince her to join us yet. I hope she decides in our favor. She would add a dimension to our work that we haven't even touched yet."

Nachtegall sensed déjà vu. Hadn't he heard this sort of bewitched infatuation earlier today? "You feel more than just respect for her intelligence, don't you, Chris?"

"Is it that obvious?"

Nachtegall nodded.

"She reminds me of someone, Bob. Someone who was very special to me. Jennifer didn't look anything like Samantha, but somehow I think they share the same spirit." Dykstra smiled faintly, wistfully.

Jealousy nipped at Nachtegall's heart. "You're not in danger of falling in love with her, are you?"

"What?" Dykstra laughed. "Are you worried about *my* heart, lieutenant? Or is it your own that you should be minding?" Dykstra's look went in ten centimeters deep.

"She does have that effect on men, doesn't she?"

"She's a married woman," Dykstra said.

"And you're five *times* her age," Nachteggall said.

"There's no reason to bring *that* up."

* * *

After the afternoon meeting with Dykstra, Samantha knew she had some serious thinking to do.

She was fixing herself a snack when she remembered she hadn't checked her mail yet today.

There was a letter from Steve.

Eagerly she brought the letter up, redirected the output to the big screen of her TV, and sat down just as the image of her husband formed. "Honey, you look so good," she said out loud. "I wish you were with me." She also noticed that he needed a haircut, and he'd lost weight.

Steve said: "Hello, my darling Sunshine. I'm sorry this is a few days late, but our . . . operations . . . had me tied up pretty thoroughly.

"I miss you, sweetheart. I want to be with you more than anything else in the Universe. Sometimes some of the other guys catch me staring out the port into space, and they say, `Look, the Moon's come out again,' because they know I'm mooning over you. But I don't care. I love you, Sammi, and I always will.

"You know I can't tell you about what I'm doing, but this military service actually turned out to be kind of interesting. My talents are being well used" Her eyes were fixed on the screen, just looking at him, drinking him in. The pain of their separation tore at her even as she melted inside while he spoke of the infinitely important mundane, important because it was all about him.

She wanted him back so badly.

Damn war, she thought anew.

". . . should be back on leave month after next, Sammi. They're giving me a whole week! Oh hon, the *things* we'll do!"

"You got that right, lover," Samantha said.

"I have to finish this letter up now. I wish I were there with you, darling. I know you tell me what's up in your letters to me, but I want to know what you're doing every minute, what's making you laugh, if anything is making you cry, what you're worrying about . . . just everything. I want to wrap my arms around you and hold you so tight I can feel your heart beating next to mine, rub my hands up and down your back, and kiss you . . . oh, and kiss you. . . ."

"Me too, hon. Me too," she whispered, tears welling.

"Good-bye, Sunshine. Until next time." And the letter was over.

She had a good cry after that. She replayed the letter five times before going to bed, and for the first time in what seemed ages, her last thoughts before drifting off to sleep had nothing whatsoever to do with Major Moore, and everything to do with Steve.

But that night she had another dream.

It was somewhat of a nightmare, but not the scary kind—more of the "something gone wrong" type. She found herself on the surface of Mars, without a suit, and she was watching her symbionts at work, an easy thing to do since they were the size of bulldozers. But something wasn't right—the symbionts were going down to the river, which itself was the result of a different project, and splitting the water molecules up, and then bringing the oxygen atoms to the desert and making iron oxide. "What are you doing?" she cried. "You're doing everything backwards!" And a bulldozer symbiont came up to her, and somehow it reminded her of the aliens, and it said, "But it's so much easier to do it this way. It's almost as if the iron *wants* to rust." And the words echoed through the last vestiges of the dream: Wants to rust; wants to rust; wants to rust; iron wants to rust . . .

She awoke with a start. The meaning of the dream flooded into her.

It was Sunday morning. Since her conversation with Dykstra the previous day, she had made up her mind to attend church this morning, something she'd lapsed in since Steve's departure. But she had to sort this out. She went to her workstation and immersed herself in the work of the genano engineer. She looked at the structure of her new symbionts, played with some different assumptions, had the computer test theoretical modifications, and by 1500 hours she had the answer her intuition had told her was there during the dream.

She had a weapon against the aliens—she could make their bones rust.

It wasn't really difficult. A few changes would allow her virus nanotool users and their hosts to live in the aliens themselves. *I haven't even agreed to work on the Phinon Project yet, and already I know exactly what I'd be doing*, she thought. *I'd better make up my mind about what I'm going to tell Moore.*

Saying no would be harder now. The temptation to prove herself yet again was overwhelming,

particularly now that she knew how to do it.

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III

Rust

Samantha went to work on Monday with a bounce in her step, and wearing her most sunshiny smile. She'd played Steve's letter two more times before retiring last night, and let the thrill of his upcoming leave drive out any fears or concerns about how she was going to answer Major Moore. She would put those concerns on the back burner for a few days and think just about her husband, and about her successes with the Martian atmosphere project.

But while she was taking readings on her cultures, Martha came up and started in on her about her weekend.

"Hi, Martha," Samantha said. "Guess what? I finally got a letter from Steve, and he's going to get leave in a few months!"

"That's wonderful, Sammi," Martha said, but there was no hint in her voice that she wanted to talk about Steve right now. If anything, she seemed nervous about something, tense, as if something was preying on her mind and she didn't quite know how to bring the subject up, yet had to.

"What's the matter, Martha? Something's troubling you."

"Can you tell me what you decided this weekend, Samantha?" Martha got out haltingly. "I mean, did you decide to work for the military?"

"Well, Major Moore introduced me to some people who felt strongly that I should join, but I haven't made up my mind yet. I know the work would be interesting, but I don't know if it would be, uh, right for me to work on it. You know, military projects are always about killing, and I just don't know if I want to be connected with that." Samantha looked Martha over carefully, and knew the older woman had something she wanted to tell her about . . . very badly. "You have some strong feelings on this, don't you?"

"I don't want you to join, Sammi. I don't want to lose you to them, too." She put her arms around Samantha, held her very tightly, was crying. Samantha hadn't had any idea that Martha was carrying around some hidden pain, but she let the woman cry herself out on her shoulder, and helped her to a chair when she was ready to talk again.

"I'm sorry for that, Sammi," she said, dabbing tear streaks from her cheeks with a tissue. "It's just that, my dad was in the Patrol, years ago. I think I told you that. He loved it, he really did. But that was during the Belt War of Independence. I was only ten when he was killed at the battle of Ceres. I was

only ten, and I didn't understand, but my mom said he'd died for something important, something he believed in . . . solar unity. I didn't know what that was, and I didn't care. But then two months later they signed the Vesta peace treaty and the Belt got independence anyway.

"He died for nothing, Sammi. Nothing." A whisper.

"I'm so sorry, Martha. I didn't know," Samantha said softly.

"That's not all of it. My daughter joined the Patrol, too, when she was just nineteen. She would have been about your age now, Sammi. The military killed her, too. She was in one of those police actions you hear about, but never know the details of. She died on Ganymede." Martha was openly sobbing again.

"They didn't even have a body to send back to me," she choked out.

Samantha cried, too.

"And you're, you're like her. So bright, so shiny, so sweet. When you first came here it was almost like having my Shelly back. That's why I've practically adopted you." And Samantha remembered what Martha had done: the gift on her birthday; the long talks, like she'd had with no one else except her own mother; the invitation to Christmas dinner so soon after she'd arrived on the Moon. "I don't want you to go and be lost, too."

Samantha made up her mind. "I won't go, Martha. I won't. I'll tell them no. I'll call Major Moore tomorrow and tell him no. I promise."

"Thank you, Sammi. I love you, little girl."

It was another hour before they actually got back to work.

* * *

Samantha felt wonderful when she returned home that evening. She felt comfortable with her decision, too, and now that she'd made up her mind, it was like a weight had been lifted from her shoulders. She was still fascinated with the aliens, of course, and she would have loved to work on understanding the alien biology, but she consoled herself with the knowledge that sooner or later, without the entanglements of the military, she'd get her chance. Eventually the existence of the aliens would be made public, and then she could study them in the comfort of an academic atmosphere.

And in the meantime, there was all of Mars to turn habitable, billions of tons of oxygen to liberate, and she was just the woman to see to it since her symbionts were clearly living up to expectations. She would be so happy to show Steve her work.

Shortly after another dinner in front of the TV, she was watching Steve's letter again when there came a buzz at her door. She left the letter running as she answered it. Outside stood a captain in the Patrol, or at least she thought that's what the insignia meant. She didn't recognize the badge the man wore on his left breast, though; the broken spaceship with black ribbon.

"Yes?"

"Ms. MacTavish?"

"That's right. If you're from Major Moore's office, you can tell him that I'll call him tomorrow, but my answer is no." She was eager to get the words out, to make her decision real.

"I'm afraid I don't know any Major Moore, Ms. MacTavish." The voice was solemn, and the man looked uncomfortable. "My name is Captain John Kleck. I'm from the Department of Civilian Relations, spouse division. May I come in?"

"Certainly. I'm sorry for not saying so earlier." Perplexed, she led him into her apartment. He declined refreshments, but asked her to sit down. Samantha muted the sound from Steve's letter, but left the visual on.

"Ms. MacTavish, I'm afraid that it's my official duty to notify you of some unfortunate news."

Samantha stiffened, felt cold all of a sudden.

"This isn't about Steve, is it?" she asked, but she couldn't keep the fear out of her voice.

"Yes. I'm afraid it is. I'm sorry, Ms. MacTavish. Your husband is dead."

"No," she said, but no sound came out.

"He died in the line of duty, Ms. MacTavish. He served in the finest tradition of the Fleet." The hammer blow had fallen. A million questions flashed through her mind: How? Why? Where? When? Could there be some mistake?

"You killed him," she said. "You military bastards killed him!" she screamed. "You let him die in your stupid, mindless, idiotic farce of a war!"

"Ms. MacTavish, please—"

"Get out! Get out now! Go! Go!" she screamed at the man, and he left as she dropped to the floor, sobbing helplessly. She looked over at the TV screen, saw Steve silently mouthing, ". . . but I want to

know what you're doing every minute, what's making you laugh, if anything is making you cry, what you're worrying about . . ."

Eventually she composed herself enough to call Martha, who came over and stayed with her the rest of the long, hopeless night.

* * *

The next days were a blur of undifferentiated activities, undifferentiated in that they were all just things that happened in that long, sickening period "after Steve died." Friends visited. Along with Martha and her husband came Mike and Terry, longtime friends of Steve and fellow suicide orbiteers. Her mother came up from Earth to be with her, aunts sent sympathy cards, and her in-laws also came. There was a good deal of crying, and a sharing of stories about Steve, and surprisingly, there was some laughter, too. Major Moore sent his condolences, and at the memorial service, she saw Chris Dykstra sitting discreetly in the back. When the ceremony neared its end, the black veil was dropped over the cross of black lunar glass that would stand out in the military cemetery at the edge of the Sea of Tranquility.

There was no body to bury.

* * *

Sunday morning Dykstra went to chapel. The sermon was old hat. His mind wandered. While Chaplain Townsend preached about the calling of Abram, Dykstra wondered about the place of the Phinons—the project name was now a synonym for the aliens—in the cosmological order, particularly if they were intelligent yet lacked souls.

He got nowhere, but at least the sermon ended before his snores became audible.

Feeling renewed both from the morning service and yesterday's visit by Samantha, he sat at his workstation filled with exceptional vigor, eager to again dive into his theoretical work on the Phinon FTL drive. It proved frustrating. Almost he was there. But some pieces were missing.

They were still missing on Monday.

Tuesday he went to the lab. "Yes, yes, Dr. Dykstra, welcome, yes, yes. You must see the mass converter now, yes, oh yes. It works so much better now, yes."

"Dr. Hague isn't kidding," Vander Kam said. "We just measured our conversion efficiency at over ninety-five percent."

"That's incredible! The Phinon's own device was only at ninety-two percent," Dykstra exclaimed. "How did you do it?"

"It was all Dr. Hague. I hate to admit it, but he pretty much just told me what to do. The result is over there." He gestured toward the machine where Hague was lovingly going over the instruments. "We think this model is the one we'll scale up to half size. Of course, we'll have to relocate to Farside Station."

"Oh? When?" Dykstra asked, surprised. His project was slipping—no, had slipped—away from him.

"I've talked to Major Moore. We'll probably be leaving within the month. The facilities in Paracelsus crater should serve. That's where the antimatter power plants are tested. But when we leave depends on when that alien drive unit gets here. Moore wants Hague to see it."

Since the Phinon attack on Slingshot, information about the raid had come out slowly, but regularly. The wrecked alien vessel had been done in when a lifeboat rammed it. Dykstra found that appropriate since Slingshot had existed to find novel ways to use kinetic kill methods against Dykstra shields. The lifeboat had rammed in just the right way to cause the shield to collapse catastrophically over the front section of the alien ship. Dykstra wondered if the pilot had planned it that way. The drive section, and the FTL engine, were left intact, and these were now on their way to Luna.

"What did he think about the other alien artifacts?"

"He hasn't seen any yet," Vander Kam replied. "You solved the intractable technological problems, and I think all those items are with the anthro and socio and psycho types. Probably the artists, too."

"Tell me, Rick—what's it like to work with Hague day after day?"

"He's not much for conversation. He drives me nuts with his speech mannerisms. And heaven forbid the routine gets changed—"

"The autistic typically require the routine and familiar," Dykstra said.

"But what can I say? He looks at something, says it isn't right, we make some changes, and they're always an improvement. It's amazing."

"He's better at this sort of thing than I am," Dykstra sighed, watching the diminutive scientist scurrying about.

"I don't know about that."

"Oh, bosh! You just told me he does things that I know I can't do," Dykstra retorted.

"You invented modern physics, Chris."

"That was a long time ago. When I was young."

"Oh, c'mon, Chris," Vander Kam said. "You duplicated the aliens' mass conversion method. No one else was able to do that. Only you could do it."

"I'm not so sure," he shrugged. "I've been working with Dykstra fields for over a century. So along comes an alien device that does a new trick. I didn't think up how to do the trick. I only figured it out once I knew it could be done and had an example in front of me." He raised his cane and pointed it in the direction of Hague, who turned and smiled, said "Yes, yes," and went back to work. "And it took another man to make the device practical."

"You're not being fair to yourself, Chris. You've been working on FTL drive studies. You could have improved it yourself if you'd been here."

"Not to ninety-five percent, Rick. Not in two weeks. Not at my age."

* * *

Wednesday morning Dykstra took the fast elevator up to the small observation bubble on the top of the High Command mountain. To the north he could see the crags and rugged undulations of the highland topography. To the south, the bare plain of Mare Crisium, broken by a myriad of small craters, spreading away to the horizon.

Sharp shadows carved the landscape.

Dykstra looked up at the stars, bright, keen, sparkling beacons outlining the road to destiny.

He'd decided this morning that he'd gotten as far as he was going to with the FTL theory until he could look inside that engine. *It's cheating*, he thought. *But I'm an old man.*

He relived the hour with Samantha MacTavish—Sunshine. She was so quick, so bright, so young. So like Jennifer. The future belonged to such as she. It would be the Sunshines of the world who would travel the road to the stars.

Dykstra descended. Emerging from the elevator, Major Moore plowed into him.

"I'm sorry, Dr. Dykstra. Excuse me. I wasn't watching where I was going." Helping Dykstra back to his feet, Moore seemed jovial.

"Quite all right, Major. Say, has Ms. MacTavish agreed to join us yet?"

Dykstra thought Moore's smile broadened a hint.

"No, Doctor. It turns out that her husband *did* die in the alien attack. She didn't take the news too well. She went ballistic; threw the notifying officer right out of her apartment. She was down on the military before—you can imagine how she feels now."

Dykstra felt a dull burning inside, wrapped around hollowness. He'd lost many himself—he knew what she was going through. "When did you find out?"

"Yesterday."

"And you didn't tell me?"

Moore's expression hardened. "Obviously not, Doctor. You have no official interest in this matter."

The major was right, but Dykstra hated the petty delight Moore was taking in spelling that out to him now.

Moore lightened up. "Lieutenant Nachtegall did inform me that you and Ms. MacTavish `hit it off' as he put it. I suppose you'll want to go to the funeral. It's tomorrow morning."

"Thanks for telling me."

"Not at all. But Samantha still doesn't know how or where her husband died. Perhaps after the war we can tell her. Right now we can't risk letting the Belt know about either the aliens or Slingshot. You mustn't discuss those subjects."

Dykstra didn't like it. "Major, I must protest. She already knows about the aliens, and Slingshot is moot now. She has a right to know how her husband died. She has a right to know how his last minutes were lived."

"Bullshit, Doctor. Bullshit! Even if I grant the existence of such a sentimental right, I'm damn sure that it is neither your duty nor your right to tell her. Do I make myself clear?"

"Clearer than you know, Major," Dykstra sighed.

"I'm sorry for leaning on you, Doctor. But security is important to me. Go ahead, take tomorrow off, go to the funeral if you wish, or just enjoy what Luna City has to offer." Moore chuckled lightly and patted him on the back.

The insincerity was galling. Dykstra said nothing, and set out slowly down the hall. He hated needing

the cane.

He went to the funeral. Nachtégall flew him into Luna City and led him to the church, but the lieutenant had other official business and so regretfully had to leave Dykstra there by himself.

From the back, he could see Samantha, in black, shuddering, crying. The minister went on at length about Steve, most of it generic kind words, of giving up his life for some greater, though unspecified, good.

His eyes were drawn to the cross of black lunar glass, Spartan, but dignified in its simplicity. It would stand with thousands of others out in the Sea of Tranquility.

Samantha slipped out quickly after the ceremony. He had no chance to speak to her, even to let her know he was there, though he thought she might have seen him once.

Friday afternoon Moore called.

"I was wondering how your work is going, Dr. Dykstra. I noticed you haven't filed any progress reports in—boy, it looks like over two weeks now."

"I haven't had much to report, Major. I'm temporarily stalled."

"I see. Do you suppose—"

Dykstra didn't let him finish. "I do not understand how their drive works. Everything I try leads to contradictions or singularities or discontinuities. And sometimes just plain stupid results."

"You're quitting, Dr. Dykstra? Is that what you mean?" He sounded hopeful.

"No, Major. I'm waiting until the drive unit comes in. I'm hoping it will provide the missing puzzle pieces. In the meantime, I'll see what other project I can help out on."

"Hmmm," Moore said. "It's not as simple as that, Doctor. The other work is all going quite well, much of it because of your success with the alien weapon. But . . . well, to be blunt, the other scientists would not welcome having you on their teams. You know, professional jealousy. And fear that you'll outshine them."

"So I'm just supposed to twiddle my old thumbs until the drive unit arrives?"

"Actually, Dr. Hague will do the studies on the drive. He's quite remarkable with technology, isn't he, Doctor?"

You're not shutting me out, Major! "In that case, I'll continue my theoretical studies. I thought it would be best to set them aside for a while and do something else, but it looks like that won't be practical."

Moore pasted on an empty smile and said, "Okay, Dr. Dykstra. But don't get discouraged. I'm sure you'll come up with something."

"Thank you, Major."

"But I need to see progress reports."

For each of the next eight days Moore received an impenetrably math-laden report he could never hope to understand. Finally, he rebelled.

"Doctor, as far as I can tell, you've accomplished nothing except sharply defining your ignorance."

"I told you a week ago I was stalled, Major." Dykstra was sitting on his couch. The major had refused a seat.

"Let's cut the bullshit. You're going to be on the next boat home if you don't justify your worth to this organization. I can't afford to have prima donna geniuses flouting my authority, particularly when they aren't needed anymore."

"Now wait one minute, Major—"

"No! *You* wait," Moore said angrily. "No one has probably ever said this to the Great Genius Dykstra, but I will. We don't need you, Doctor. You've done good work for us, certainly, but we have Hague now, and he can carry the same load. Besides that, he doesn't threaten to go over my head to get his way."

"When did I ever do that?"

"When you forced me to go after MacTavish, Doctor. Or had you forgotten?"

No, he hadn't forgotten the conversation. But it was clear to Dykstra now that when he'd said he could get more funding, Moore had only heard the part about going to the superiors.

The major continued to fume and sputter, finally saying, "Should we send you home, Doctor?"

"I no longer have a home, Major!"

Moore left, hot as hell, but not yet ready to fire the foremost genius of the age.

Sunday, the men arrived from Slingshot with the alien drive.

* * *

A corner of the huge docking bay had been converted into a laboratory for work on the drive section. Dykstra had watched as the tail of the half-crushed alien ship was maneuvered into the lab from the bay proper.

It had taken the Patrol a month to bring it in from Slingshot, a month spent in near total communication silence lest the Belt discover them.

A month in which he'd been unable to understand how it worked.

Now he stood before it, alone.

They'd cut open the hull to expose the engine; four meters long, three across at the widest, looking like a tin can that had been crumpled and stretched back out.

Dykstra was not allowed to touch it.

Arie Hague would be along soon; he and Rick were en route from Paracelsus crater where they'd been looking over the facilities. Major Moore had not specifically forbidden Dykstra to work on the engine, but he'd made it clear that Hague would be in charge of studying the thing, so it would only be proper courtesy that the "other genius" of the Phinon Project get to open it up first.

Of course, putting the pliable Hague in charge meant that Moore would call all the shots.

And take the credit.

"You've foiled me, fiendish engine of alien sorcery," Dykstra said. Perhaps it was best that he couldn't open up the drive unit himself. Yes . . . it would be better to let someone else work on it. *Someone who can get along without a cane*, he thought as he tapped it against the hull of the ship.

"Hey! I hauled that sucker nine billion kilometers to get it here. Why are you hitting it with that stick?"

Dykstra turned to see a black man, perhaps in his seventies, wearing coveralls, coming from the doorway. Despite what the man had just said, he looked amused.

"This thing has caused me a month of sleepless nights," Dykstra said. "Just be glad I'm only giving it love taps. By the way, I'm James Christian Dykstra."

"As if I don't know. I'm Roger Tykes. People call me `Pops.' "

"You look older than the average Patrol officer," Dykstra noted.

"Hah! As if you should talk, Doctor."

Dykstra liked him. "Please, call me Chris."

"I am older, Chris. But piloting spaceships is what I like to do. Anyway, I'm too old for the front lines, so I was stationed at Slingshot. That's why my crew and I were the ones who brought that baby in," Pops said.

Dykstra lit up. "You were at the base when the aliens attacked? I know most of the story, but the details were hazy on how we got this drive section. Something about a lifeboat crashing into one of the attacking ships."

Pops became solemn. "Chris," he said, "you find the real heroes among the damnedest people. It was one of the scientists who did it . . . just a kid ensign drafted for his brains. He'd been ordered to get away in a lifeboat. Then all of a sudden the lifeboat comes screaming back, and the aliens must not have been paying attention because they never touched him. He rammed this one," Pops said, patting the remains of the ship with his hand, "on the nose of the shield, and the front crumpled to nothing. The other ship turned tail and ran after that. And I mean ran. Wait until you see the pictures on that."

On a strong hunch, Dykstra asked, "What was the ensign's name?"

"MacTavish. Steven MacTavish. We called him `Mackie.' Quiet kid. Newlywed. Did brilliant work but wanted nothing more than to get back to his wife."

"I knew it," Dykstra whispered.

"Eh? You knew him?"

"No. But I know his wife. He had every reason to want to come home."

"Tell her she should be proud," Pops said. "It won't help her much right now, but he saved us. A lot of others aren't feeling the pain she is now because of what he did."

Dykstra frowned. "I can't tell her. Security. She thinks he died on a battleship."

"That's bullshit. She has a right to know. Screw the regulations!" Pops said.

After Pops left, Major Moore arrived with Vander Kam and Hague.

"Here it is, Dr. Hague. The Phinon FTL drive engine. It's all yours to tinker with." Like a father to a half-witted son.

But Hague did not look delighted at the prospect of opening up the engine. He looked scared.

"Go ahead," Moore said. "Go look at it, Dr. Hague."

The diminutive scientist approached it slowly, revulsion evident upon his face. He reached out tentatively to touch it.

"He's afraid of it," Vander Kam whispered to Dykstra.

Dykstra just watched.

"No!" Hague said, backing away. "No, no, Major Moore. No! It's not right. It's not a right thing! It's not a right thing."

"But Dr. Hague, you've got to look at it. . . ." Moore said, confused.

"No! No, I won't! I won't! No, no, no. It's wrong." He started to cry. He turned to the major, grasping his sleeve. "Don't make me touch, Major. No, please, don't make me," he pleaded.

"But, Doctor—"

"No!" Hague screamed. "No! It's wrong! It's a wrong thing! No!" He bolted out of the lab, a fast scurry with his short legs.

"Oh, damn it!" Moore said.

"Dr. Hague is not a normal scientist, Major," Dykstra said. "He's an autistic savant. As high functioning as he is, it may be that he literally cannot deal with something as strange and *alien* as that drive."

"You'd like that, wouldn't you, Doctor?" Moore said hotly. "Well don't count on it. We'll get Hague psychiatric help, or sedatives, or whatever the hell it takes. But he'll work on that engine, goddamnit!" He stormed out.

"I don't think so," Rick said, watching the major leave. "He doesn't know Hague like I do. Do you know Hague has to have his tea every day at exactly 1600 hours? If it's late in coming, he gets really upset, kind of like he just did. If he doesn't want to work on it, he won't work on it. End of discussion." He

punched Dykstra lightly on the shoulder. "Congratulations. She's going to be your baby."

* * *

That evening Dykstra scanned the new material in the Slingshot file. Pops and his crew had brought in the actual data cubes from the Slingshot computers.

He found the records dealing with Steve's heroics, but not the second ship escaping. Those records would be available tomorrow, and he'd see them, with everyone else, at the afternoon briefing.

Among the records was a transcript from the voice log of Steve's lifeboat:

SM: "I'm out, speeding up fast . . . there's the ships . . . oh! There goes the perimeter battery. . . ."

Voice identified as Lieutenant Nick Malloy: *"Steve, is that you running?"*

SM: "It's me, Nicky. Turning tail and bolting for the blue."

NM: "Godspeed, Steve. Tell them what's happening."

SM: "Where are you?"

NM: "Right where you left me—the tracking room. We've lost half the personnel. Tell my wife I love her. Shit! He's making another pass!"

SM: "Where is Pops?"

NM: "Out in the Ranger, trying to fight them. He doesn't have the firepower, though. Brave son-of-a-bitch. I can see him now. You should be able to see him, too."

SM: "Got him. He's vectoring . . . rocket away. A hit!"

NM: "They didn't even move. Oops! You see that? The bastards winged him!"

SM: "Pops, are you out there? Do you need help?"

Voice identified as Commander Roger Tykes: *"Of course I'm here, Mackie. Get the hell lost! That's why they put you in that lifeboat."*

SM: "But—"

RT: "No, goddamnit! Your duty is to get clear. You may be the only record that gets out of here!"

NM: "They're releasing another rocket. Oh my God . . ."

SM: "Nick!"

NM: "Good-bye." Heavy static.

SM: "God. Oh, God!"

*RT: "Another micronuke. Don't know why they don't just blast us to smithereens . . ." hiss and crackle
". . . damn signal is breaking up."*

SM: "I've got an idea, Pops. I'm turning around."

RT: Unrecognizable . . . "No, your . . ." static.

SM: "I can't run out, Pops. I think I can get one ship. Their shields are like ours. I can ram, use the lifeboat like a KKV, collapse the shield."

A tear trickled down Dykstra's cheek as he read the account.

SM: "Getting close now. Suppose I should have some final words . . . I love you, Sammi . . . but I have to do this . . . remember John 15:13 . . ."

"Time to tweak the course. My target is still dawdling around. The other is hanging with him, just popping off shots. There—that should do it. Let's see what we can leave for Christmas. . . ."

"Eight seconds. Good-bye, Sammi. I love you. Take me now, Jesus. Take this you son-of-a—!"

The account ended. Dykstra stared at the screen.

He knew. He knew he could leave the tail intact. "It wasn't enough for him to just save his friends. He had to give us a shot at having their faster-than-light drive, too." Whispers.

He gave up his life for that. And his widow doesn't even know.

But I do. He thought of Sammi, the smile, the twinkle in her eyes. He thought of the shattered woman at the funeral. He thought of the alien drive, and Hague horrified. Opening it was his last chance to understand it.

The options were clear.

"Keep quiet, and stay. Tell her, and be sent away."

When I was young it wouldn't have even been a choice.

* * *

Lieutenant Nachtegall was worried about his friend. As he walked to the briefing in the tracking room, he thought about what Chris had been through, what had turned him *old*.

He'd noticed the change after he'd returned with Hague, though it had started before, with the destruction of Dykstra's home. Then Hague had become the new *wunderkind*, Dykstra's project had slipped away from him, and even the Hague Limit had turned out to exist. Following that, weeks of failure at trying to build a theory of FTL drives.

And sandwiched among them, a meeting with a delightful Samantha followed by a funeral for her husband.

Nachtegall had read Dykstra's biography—he knew what sort of memories that must have brought back to the old man.

And last night, a new concern had been assaulting his friend, though he wouldn't tell Nachtegall what it was.

The lieutenant turned a corner, took a dropshaft down two floors, entered another long corridor. Almost there.

After leaving Dykstra last night, Bob had ferried some of the technogeeks out to Luna City, and joined them at a popular club.

At one point the conversation had turned to Dykstra. The others had also noticed his rough mood. One young scientist remarked that anybody would be depressed at not getting anywhere on a problem for a month. Dr. Manlinkov snorted. "Ah, that's the problem with being such a mind as he is. All his life it has been easy for him. Now he fails to overturn the foundations of physics in only one month, and this troubles him. Hmph! I should have such troubles."

Then the conversation had turned to Moore. The scientists didn't like him at all. "He feels threatened by Dykstra," one said. "We're all threatened by Dykstra," another laughed. "It's not fair, though. Dykstra earned all of his respect. He shouldn't have to take guff from a pinhead like Moore," the first retorted.

Nachtegall stood before the door to the tracking room. He'd tell Chris about last night, that the others liked and respected him. Maybe it would help. Sometime after the briefing, though. He entered.

All the Phinon Project scientists were there. Chris Dykstra stood leaning on his cane, eyes tired, looking like he felt every one of his years. Major Moore was smugly directing the man at the viewer controls to call up the Slingshot material; their first look at the alien spacecraft activating its drive as it fled the base. There was Rick Vander Kam, standing next to Dr. Hague, fidgety and agitated, staring only at the floor.

Dykstra tried to speak to Moore. "Major, you wouldn't see me earlier, but before I view this—"

"Wait until after the briefing, Doctor," Moore said, irritated.

"You may not want me present at this briefing."

"Lieutenant Jones, continue with your work," Moore said to the man at the console. He faced Dykstra. "This briefing will continue on schedule."

Dykstra persisted. "Very well, Major." He took a resigned breath. "I'm going to tell Samantha MacTavish how her husband died. As soon as this briefing is over."

Moore was livid. "That's insubordination, *Doctor!* And this is wartime—"

"Lighten up, Major," a voice called from among the scientists.

Nachtegall stepped in. "Hang on, Chris. Sir."

On the big screen, the stars burst into view, then swung sideways until the camera locked onto the alien ship, a vessel of odd twists and turns.

"What seems to be the problem?" Nachtegall asked.

"The major won't tell Samantha that her husband died at Slingshot. That he is the one responsible for both saving the base and getting us the alien drive unit," Dykstra said.

"She has no need to know," Moore said. "Now sit down." He looked at the screen and addressed the gathering. "Here is the remaining alien ship. Notice carefully . . ."

"Is that true?" Nachtegall whispered.

"Yes."

". . . patterned in a twisted torus," Moore continued.

"That's wrong, Major!" Nachtegall interrupted. "Samantha has a right to know. She's no security risk! Hell, she already knows more about the aliens than—"

"That is enough, Lieutenant! You are dismissed. Confine yourself to quarters. And you, Dr. Dykstra—" he began, but Dykstra wasn't listening.

Dykstra stood transfixed by the screen, his eyes focused on infinity, his mind a million light-years away.

On the viewscreen, the alien ship turned rapidly. The tail section began to waver, then the ship was gone, just a streak into the deep heavens. The data readout in the upper right corner of the screen indicated an acceleration of two hundred million gravities.

A scream came from the back. "No! No! It's not right! A wrong thing!" Hague was crying, shuddering, trying to hide inside himself. "No, no, no, no-no-no-no-no-no." He slid to the floor. Vander Kam stooped to help him.

* * *

Dykstra couldn't take his eyes off the screen. There was the ship, the tail wavering, like he was viewing it from a hundred meters away over hot pavement. Then, zoom, gone, at an acceleration of two hundred million gravities. No, it had to be an *apparent* acceleration. Yes, and that would mean . . .

* * *

Nachtegall was watching Dykstra. "Staring off into infinity, seeing things no others can see, nor even imagine." That's how the biography had put it. Bob was seeing it now.

* * *

It was there, all of it, laying itself out. Faster than he could consciously think, his wonderful, peerless mind assembled the answers before him.

Of course the causality paradoxes would go away if . . .

Yes, the transition to hypervelocities had to take place at minimum . . .

Trying to cross the Hague Limit in FTL drive would . . .

It was coming to him, unfolding, like the hand of God unrolling a scroll before him.

You are James Christian Dykstra, and through you, God will give Man the stars.

* * *

"Look at him, Major!" Vander Kam was pointing at Hague. "Look what you've done to him!"

"He'll be okay—"

"He will not!" Vander Kam shouted. "He's not your little tin soldier to push around and command. He can't handle this! He's not emotionally equipped for it, you idiot!"

THWAK. Dykstra slammed his cane on the table. "Enough!" he said, and everyone listened.

"He's back," Nachtegall said, awed. "He *knows*."

"Rick, take Dr. Hague home, please," Dykstra said.

"Now wait one damn minute, Doctor!" Moore spat.

"Silence!" the old man said, eyes ablaze, again slamming his cane on the table. No one moved. The scientists bearing witness hushed. Moore, always more paper pusher than soldier, shut up.

Dykstra continued. "I now know how the FTL drive works, Major. Do you understand what that *means*? For the war effort, for the human race, for the future, Major? Do you understand what it means for *me*, Major? Do you understand what it means for *you*?"

Nachtegall saw the passion, the sparkle, the fire in Dykstra's eyes. This was the man he'd read about, the foremost genius of the age, as he must have been in his prime.

As he was now.

Major Moore backed down. "Dr. Dykstra, I'm sure we can work something out. Let's not remain angry."

Dykstra laughed. "Your reasonable attitude delights me. Major, I will continue to work for the Phinon Project. And I will give us a faster-than-light drive."

Dykstra started for the door. "But before I actually write anything down, I have another chore to attend to. Lieutenant Nachtegall, will you give me a lift to Luna City? There's a certain young widow I must visit tonight."

* * *

Samantha had returned to work a week after the funeral, but her sense of purpose had vanished. Friends told her it would take time, but she wondered if there was any truth to what they said. In the evenings, Samantha returned to an empty apartment, to see Steve's things, to have every room remind her of times when they laughed together, ate together, or loved together. And there was nothing for her to do except to helplessly tolerate it.

Samantha was staring at the walls, not crying, not laughing, not feeling anything but a numb hollowness inside, when Dykstra came to visit.

She answered the door and found the old man standing outside with his cane. "Hello, Sammi," he said. "Let an old man with a walking stick in?"

"Of course, Dr. Dykstra." She motioned him in. "Pardon the mess. I haven't been much into cleaning lately."

"I am as sorry as I can be, Sammi. At my age, I've lost a lot of people who were dear to me. They still are. Practice makes it no easier."

"Thank you. And thanks for coming to the funeral—it meant a lot to me." She looked at Dykstra, standing there with his walking stick, and even though he was in the hated military, she could hold no blame against him. "Take a seat, please," she said. "Would you like me to turn down the gravity?"

"I would be more comfortable. Thank you." She did, and in a moment was sitting across from him.

"So, Doctor, were you just out visiting widows tonight, or did you have some other reason for coming?" She hadn't wanted to sound bitter, or suspicious, but she couldn't help it.

"No, Sammi. I know you're wondering if I'm here at the request of Major Moore. I'm not. I came for personal reasons. The major has given up on you."

"Thankfully, I'll bet. That's fine. I won't work for the goddamn military—bunch of little boys slaughtering each other, and for what?" She had an answer, but she stopped herself, not wanting to get worked up.

"Samantha, please. I only want to tell you how Steve died, what really happened."

"I thought his ship was destroyed. They didn't have a body to return to me."

"Sammi, Steve didn't die in the war—the aliens killed him."

"What?!"

Dykstra laid his cane across his legs and continued. "I'm not supposed to tell you what I'm about to tell you. But one of the advantages of being me is that I'm going to be able to get away with it. People with Steve's talents aren't put on battleships, Sammi. He was working on something called Slingshot; another secret project based on a sliver of rock sixty astronomical units out."

"That's beyond the Hague Limit, right?"

Dykstra's eyes lit up and he smiled. "You see it already. As I was saying, Slingshot involved sending kinetic kill projectiles on ultra-close-approach orbits past airless bodies: Steve's unique field of expertise. Massive, fast-moving bodies are still the best way to crack through a Dykstra shield. It was hoped this method could be used to attack the Belt.

"But that work is moot, now." Dykstra paused and just shook his head.

"Was Steve good?"

"His work was brilliant, Sammi." Dykstra's eyes glistened, holding back tears.

He continued. "The Slingshot base was attacked by two alien ships, apparently identical to the one that hit OEV 1. Slingshot isn't heavily armed. When general quarters sounded, Steve was ordered to leave in a lifeboat. He was able to watch the attack as he fled. Slingshot was getting hammered. Steve . . ." Dykstra stopped, choked up. Samantha came and sat next to him.

"What, Chris? What did he do?" She knew, but she had to hear it.

"He was clear, Sammi. He could have escaped. But he turned around. He knew . . . he knew he could . . . he could take out one of them. . . ." He was too overcome to go on for a moment.

"He rammed their ship, didn't he?"

"Yes. Their shields are almost identical to ours. He knew what to do. He rammed their ship. That's why there wasn't any body to send back."

They held each other and cried.

Later, both wiping away their tears, Dykstra said, "I apologize for the emotional display, Samantha. I have a weak spot for heroes."

"It was like him. His favorite verse was always John 15:13."

Dykstra nodded, understanding. "There's a bit more," he said. "After Steve rammed the one ship, the other fled immediately. We have some very good data on that. It took off with an apparent acceleration of two hundred million gravities. That's to be expected in a transition to hypervelocities" The old genius was looking off at nothing again, lost in thought.

"How do you know that's to be expected, Chris?"

He came back. "I *see* it," Dykstra said, passion blazing in his eyes, young again. "I see how it works in my mind. The principles are laying themselves out for me."

"You're going to give us a faster-than-light drive, aren't you, Chris?"

"Both Steve and I will, Sammi. I'm certain. Steve knew all there was to know about how a Dykstra shield collapses when struck with sufficient energy, and at different points. His impact tore off the front of the alien ship, but it left the drive section intact. He would have known how to make that happen.

"That drive unit is on the Moon. I have it. Steve's friend brought it in. He told me the story."

They were quiet for a while, each with their own thoughts. Then Samantha, staring into the blank TV screen, asked, "Did you think I'd decide to join the Phinon Project when I heard the story?"

"That wasn't my reason for coming, Samantha. You had a right to know how your husband died. That's all."

"But you accomplished the other." She faced Dykstra. "I don't like war. And I don't like the military. But I've let all of you try to convince me to sign on because the aliens are the most exciting thing to come along since . . . maybe forever. I wanted you all to give me an excuse to salve my conscience, make it so that I could work for you but not soil myself."

"But we failed."

"No. I don't know if Major Moore is right, or if Richard Michaels is right . . . or even if you're right, Chris. Does it have to be war? Are all the aliens the same, or are these just the bad guys? All I know is that Steve . . ." She reached for a tissue. " . . . is that Steve . . . could have gotten away, come back to me. But there was something more important he had to do."

Dykstra waited until she could talk again. "There's more, isn't there, Sammi?"

"Steve made his decision. When he turned back, he joined your side. I'm going to finish what he started. But I'm scared, Chris. I . . ."

"Why?" Gently.

"Because right now I want to kill them. I know how; I know how to rust their bones right out of their bodies. But what if I'm fooling myself? What if I really only just want revenge?"

She looked into Dykstra's eyes; those old, sparkling, wise eyes, and saw something behind them, perhaps something that Dykstra remembered.

"You don't, Sammi," he said. "I *know*."

Dykstra got up and drove his cane smartly into the floor. "So what do I tell the Major? Sunshine goes to war?"

She'd have to explain to Martha, she knew, explain the reality that Martha's father and daughter had known. It would hurt, but she would do it.

"Sunshine goes to war," she said.

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Part 2 Sunshine Goes to War

Prologue

The Belt called the comet "Glacierville" and they needed it for water. There were twelve ships hanging around the comet. Two were cutters, there to carve off iceberg-sized chunks of ice. Three were drive ships, designed to attach themselves to the ice chunk and serve as thrust units to propel it to the Belt. Two more, which sat on the surface at the Glacierville bubblebase, were ordinary transports for people and cargo. The remaining five, two large and of wicked configuration, three others sleek and agile, were military craft.

Glacierville orbited the Sun at a mean distance of 83 A.U., inclined 54 degrees to the ecliptic, and was currently as far from the sun as it would ever get. The comet was almost entirely water ice, a 140-kilometer-wide reservoir. It had been discovered around the time of the Belt War of Independence, and had helped the Belt survive that war when the Solar Union had denied them access to the water facilities in the moons of Jupiter. Glacierville had gone out of service during the calm period from 2070 to 2090 when the Belt was once again allowed through treaty to mine the Jovian minor satellites for water.

But now there was another war on, and the Belt had been forced to return to deep space to ensure its water supply. Though it wasn't politically acceptable among the members of the Solar Union to deny the women and children of the enemy their precious water, whether or not it would remain that way depended entirely on the course of the war. If the Solar Union started to lose, the System Patrol ships would come.

Hence, the presence of the Belt military ships.

Jason Hanson was looking at those ships on the main viewscreen. He particularly enjoyed watching the sleek fighters, even though at the moment they weren't doing anything except station keeping. He had tried to become a fighter pilot ten years ago, but he didn't have the reflexes for it. Instead, he'd done his stint in the Belt Defense Forces as a transport pilot, a position insufficiently romantic to make him want to reenlist after his first hitch. Now he was a cutter pilot, proficient in maneuvering his ship as it bored the holes and dropped the charges that broke off kilometer-wide pieces of Glacierville.

But he still liked looking at the fighters. "Cutter One to Cutter Two," came over the radio. "What are you up to, Jase?" It was Mitch, the pilot of the other cutter. The cutters were large, every bit as big as a mid-sized luxury spaceliner, but almost all of their bulk was given over to the boring lasers and the charge hold. The pilot's cockpit jutted out from the front of the cutter like an afterthought, and the typical crew complement of such a ship was one.

"I'm just looking at the warbirds, Mitch."

"Again? But they're not doing anything. If we're lucky, they'll never do anything out here. You still wishing it was you in that pilot's seat?"

"Of course," Jason answered. "I still love the old *Lulubelle*, but she's no hot fighter." Having found the official designation of his ship short on imagination, Jason often referred to her as *Lulubelle*. "Haven't you ever wanted to ride something that can kick you in the ass to sixty gees?"

"I did," Mitch replied. "Her name was Candi Kane. And yes, that was her name. No shit." They laughed.

Jason reoriented the viewscreen away from the warships to watch the activities near the comet. He and Mitch had separated a "berg" a couple of hours before, and the thrust ships were still attaching themselves to it. Once they were finished, Mitch and Jason would have to go back in to slice off cumbersome projections to give the berg a convenient thrust axis. It looked like the third thruster had almost finished securing itself, and Jason awaited the first test-firing that would tell the berg crew where Jason and Mitch needed to do the trimming.

Suddenly a fighter streaked through Jason's view, accelerating at full.

"What the hell?" Jason said. "Hey, Mitch—where's that fighter going? Can you see it?"

"It's not just one fighter," came back. "They're all moving out. They must have spotted something way out on their scanners because I sure as hell can't find anything on mine."

"Which way did they go?" Jason asked, adjusting the viewscreen in a so-far-fruitless attempt to find the ships.

"Right into Orion."

Jason tweaked the viewscreen and caught the intense glow of the military drives. "Found them, Mitch. I still can't see what it is they're after, though."

"I'm trying to pick up their cross-talk," Mitch said. "But nothing doing. They're hushed."

A nova appeared briefly, whiting out the viewscreen, then settled down quickly into a fourth star in Orion's belt, only to fade rapidly to nothing.

"Holy shit! What was that, Jase?"

Jason watched the screen grimly. "That was one of the fighters. Whoever is out there just destroyed one of the fighters."

The four remaining drive flames diverged in random directions. The two biggest flames, those of the light cruisers, winked several times, and Jason's trained eye told him they were on their way back to Glacierville. He still couldn't see what they were fighting—the drive flames from the Belt ships were the only ones out there.

Something appeared on Jason's scanners. He noted the position and adjusted the viewscreen to those coordinates. Spotting it, he magnified the image.

He wasn't sure what he was looking at.

It was a spaceship, at least that much he was sure about, but the configuration was unheard of. It seemed composed all of odd twists and turns, with snaky projections from the front and the sides. It had an oddly organic look, yet was clearly made of metal. A bronze statue of an octopus Jason had once seen at a zoo came to mind.

The ship just hung there with its front pointing at Glacierville. Jason backed off on the magnification and the body of the comet came into view.

"Are you looking at what I'm looking at?" Mitch said, his voice startling Jason.

"Yeah. That's no System Patrol ship, is it Mitch?"

"No." Then: "Do you suppose they're little and green?"

At that moment, the tip of the frontmost projection on the alien ship lit up brightly. Down on Glacierville the bubblebase erupted in a fierce explosion.

"They're opening fire! Mitch, we have to do something!"

"I *am* doing something," Mitch said. "Engines to full, Jason. I'm going to try to run. Whoever they are, they're going to have to worry about the warships first."

"Good luck," Jason said. And Mitch would need it—a cutter couldn't pull more than a gee. "But I'm not going to run," he said to himself. There was something else he wanted to try.

The strange vessel suddenly streaked away, a dazzling white line, then nothing.

Jason expanded the viewscreen image, backing off until he could see almost a full hemisphere of sky. He spotted Mitch's cutter right away, picking up velocity pathetically slowly.

"What do you think you're going to do, Jason?" Mitch asked with more than a trace of sarcasm.

"I'll let you know. Besides, how far do you think you're going to get if that ship comes back? Did you see it take off?"

"Dammit, Jase! What else can we do? We don't even have Dykstra shields for God's sake. You saw what happened to that fighter."

Jason was distracted from answering that question by what was happening outside. "Look in the southern half of Orion, Mitch."

Jason could see the drives of the light cruisers. They were several degrees apart. Suddenly one of the ships turned briefly into a glowing pearl—a bomb had spent itself against the ship's Dykstra shield. Another pearl appeared down and to the right.

There had been no drive flame there, and Jason assumed one of the Belt ships had gotten off a missile of its own.

A fireball flared on the extreme left of the view. "Damn, that was another one of our fighters," Mitch said.

"I couldn't tell," Jason replied. "We have three ships left, then."

"At the moment."

A set of three pairs of white streaks converged in the region of the light cruisers. Pearls appeared around each ship, but instead of fading, grew brighter and brighter. Almost simultaneously, the pearls collapsed to be replaced by incredible explosions that again momentarily overloaded the viewscreen. The screen came back up just in time for Jason to witness the last fighter going up, which again knocked the viewscreen out for a welcome three-second-long respite.

"That's that," Mitch said. "Maybe they'll leave now."

Jason was watching Mitch's cutter again. A white streak terminated near him. Cranking up the magnification, Jason could see the alien ship. "There's one behind you, Mitch!" he yelled.

The alien fired and Cutter One turned into a thousand pieces with no shortage of hellfire and smoke.

"Oh damn."

Jason noticed the berg he and Mitch had carved out. Another of the aliens was by it. One by one it drilled the thruster ships, and the explosion of the last was hammerblow enough to cause the berg to shatter. Then the ship turned and started accelerating toward *Lulubelle*.

But Jason had been waiting for this. He was already lining up his ship properly. The lasers used in cutting comets apart, though not tuned to the optimum frequency for attacking shields, were nevertheless among the most powerful ever constructed by the Belt.

Jason picked his moment. He let the alien have it with the full fury of the cutting beam. A pearl, followed by a most gratifying glimpse into hell, and the ship was no more.

Jason expected the others to come get him. Instead, he witnessed seven white streaks that disappeared into the vastness of interstellar space.

He turned up the radio transmitter to full. "Is anybody out there?"

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I

The alien femur lay clamped in its cradle within the sealed chamber, not showing much of anything yet. Primarily a tube of steel, the interior crosshatched with countless interwoven struts, the bone was extremely strong. It was the sort of thing one might expect to find in a piece of heavy equipment, like a bulldozer or crane, which befitted creatures who relied on hydraulics—pistons, cylinders, and pumps—to make their bodies go.

The bone looked slimy.

It was covered with a thin nutrient solution, a close copy to the wet environment inside of a living Phinon. Or so Samantha MacTavish hoped. Right now, her genanobugs were flitting through that slime. They had work to do.

Sammi watched the monitors with intensity. In addition to the camera viewing the bone from the side, another was situated to look down the long axis through the interior of the tube. She wanted to observe the activity of the genanites from both angles.

Though it was through her toil that this set of bugs had come to be, she wasn't certain how they'd behave in the real environment. Would their attack on the surface of the bone appear first, or would the interior structure suffer the initial ravages of the bug invasion?

Blond, beautiful, with a smile so bright it had earned her the nickname of "Sunshine," Sammi had of late borne witness to none of the usual adjectives her friends would use to describe her. Lately she'd been tired, drawn, and it was obvious that she'd lost weight, and most certainly not in a good way.

An internal sensor indicated that the bone's temperature was rising slowly. Sammi continued to watch.

She'd been toiling in the lowest regions of the System Patrol High Command complex for weeks now, working hellishly long hours, sleeping only when she had to. The work kept her mind busy, kept it off the recent loss of her husband Steve. Sleep had too often brought dreams, which had too often brought desperate, lonely awakenings. And tears; a profusion of tears.

She hadn't been back to Luna City in over a month. Martha had tried to contact her several times by phone, as had some of Steve's buddies. She had read their messages, but hadn't answered them. What was there to say? Her friends at the High Command were concerned about her, too. Lieutenant Nachtgall checked up on her whenever he was at the base. She was glad for that, even though she knew his concern was out of more than friendship. Dr. Vander Kam and his sidekick Dr. Hague dropped by her lab on occasion, always pretending to be interested in her professional progress, bless their kind, dishonest hearts.

The temperature was climbing steadily now. Sammi increased the magnification on the exterior view monitor and noticed the first beginnings of discoloration. A pale red was emerging out of the featureless gray of the bone surface. She did the same trick with the axial view. Some of the thinner struts had already frizzed and separated.

The corners of her lips began to curl up.

Lately, it was only with Dykstra that she'd been willing to open up. Since that night the old genius had shown up at her apartment with his cane and his story of how Steve had really died, they'd formed a bond. Though he was a full century older than she, there was a connection between them that knew nothing of clocks and calendars. There was nothing sexual about it. There was none of that father-figure nonsense about it either.

Minutes passed. The reaction continued. Now things were really moving. Reddish-black ragged patterns were appearing all over the outside of the femur. Flakes were forming and precipitating to the bottom of the chamber. The interior view revealed that all of the crosshatching bars had disintegrated, wrecking the structural integrity of the bone.

With grim delight Sammi formed a picture in her mind of an infected Phinon, a clear image of a biped, with arms and legs that bent backwards and came out of the body at funny angles, every joint knobby with a connected, rigid tendon tied to an organic piston. Then slowly, as her bugs worked, she imagined the body starting to crumple as the skeleton weakened, internal stress causing the limbs to bend where there were no joints.

Inside the chamber, the bone was only a blackened shell of flakes, something that would shatter at the flick of a finger.

Samantha's husband had died fighting these aliens. She wanted to get even. She had just seen the successful completion of step one. It brought to her face a fierce version of the thousand-kilowatt smile that had earned her the nickname of "Sunshine."

* * *

"Colonel, the data from the Belt Defense Forces is available now," the aide said.

The quick, crisp man behind the desk said nothing, just swiveled around in his chair and hit the control stud to the main holoscreen on the office wall. This information from the BDF was the colonel's first tangible benefit from the hastily negotiated cease-fire, now all of a day old. The aide departed without a dismissal while Colonel Thomas Knoedler took in the visuals from the display.

The scene was from somewhere out in deep space. The exact coordinates were available, though at the

moment not of interest to the colonel. What was important was that the spot was located dozens of astronomical units beyond the Hague Limit.

What were even more important were the white streaks converging on the spot, several every minute. Of an intense, brilliant white, the streaks were the deceleration signatures of Phinon spaceships dropping out of hyperdrive. Dropping out, but for days none of them had been reentering.

And there isn't a damn thing out there for them to be interested in. Nothing of ours. Nothing of the Belt's. Even the outer asteroid belt doesn't extend that far. So what are those bastards up to?

As head of System Patrol Intelligence (in practical terms, though he answered to the Joint Staff), Knoedler had found trying to outthink the Belt entertaining. Trying to figure out the Phinons was a torment.

They were clustering out there for some reason. Massing for an attack? The possibility had to be planned for; preparations would have to be made to meet the threat if it materialized. But by now tens of thousands of spacecraft would be out there.

There was another possibility. The Phinon ships might be speeding off with their sublight drives. But why do that? There was a lot of territory out there. Intelligence had learned a lot from the wreckage of the Phinon ship returned from the attack on Slingshot. Dykstra had even figured out their hyperdrive. Their sublight drive used the same engine, but it could not be used inside the Hague Limit any more than their ships could enter hyperspace inside the Limit.

The display ended. It had been nothing more than ten minutes' worth of streaks converging on one part of space.

The colonel hit the button to play it again.

What are those bastards up to?

* * *

Dykstra was enjoying a happy state of confusion. This was pleasant—happiness had been in scant supply of late. Having solved the secret of how the alien FTL drive must work (in theory), he had been engrossed in his work of duplicating the alien engine hardware into equivalent human machinery. The damaged Phinon engine sitting in the lab had yielded up countless secrets; yielded them up to perhaps the only person in the entire Solar System with the ability to understand them.

The work had been a delight so far, so vastly different from the low period where he'd had to fight with his younger self, the inventor of Dykstra field physics. His physics had said that faster-than-light travel was impossible. Had said. The aliens' FTL drive had forced him to tear down his old ideas, and build

them anew, getting nowhere in the process.

In his mind, he again relished the instant when, like the hand of God unrolling a scroll before him, *like when he was young*, the answer came.

Chris Dykstra knew how the Phinon FTL drive worked. He was well on his way to designing the human version.

And it had just now occurred to him that he was going to be able to go the Phinons one better.

Dykstra continued his walk inside System Patrol High Command, using his cane infrequently. Just how big the complex had grown was anybody's guess. Rumor had it that some tunnels snaked their way for fifty kilometers underneath the regolith, with a labyrinthine array of interconnections and spiraling turns, as if each corridor was an individual strand in a vast spider web. From this vast web the orders had originated to conduct the war between the Solar Union and the Belt. Had originated. The war was now under a cease-fire; the Belt's recent experience with the Phinons at Glacierville had caused the combatants to pause.

But Dykstra's concern was with the possibility of war with the Phinons. He mulled over the circumstances that had brought him to this place. Even as memories of the recent past coursed through his brain, another part continued to sort out the tricks of the FTL drive. He knew he was on to one humdinger of a new wrinkle.

Ah, this was how it used to be for him. When he was a young man, he'd often take walks, just leave the workstation and the lab behind, heading out into the woods or strolling along the beach, wherever, and watch as his mind would solve problems for him, delving into the deep mysteries of physics and coming up with astonishing surprises. (At least, that's how his biographer had put it. Jenny was the dearest of his old and long departed friends, but he'd always felt she'd gushed a bit too much in that biography.)

Here, he didn't have a beach or a wooded path, so he'd made his way to the elevator to the observation bubble. It took him up to the top of the mountains and he stepped out to survey the beauty of desolate Luna. It was local night, but the half Earth hung bright and beautiful. He picked out California. Up until a few months ago he'd had a house there. A Belt raiding mission had destroyed it. Once again he fought down the sickening feeling that the memory brought on, rationalizing that hollow place inside him off to the side. He looked lovingly at his walking stick. It was all that remained of home.

But there was another place, and he moved his eyes to the Great Lakes region. It was under clouds, except for most of Lake Superior. Dykstra had been born in Michigan.

If things went well, he'd be going back there soon, to continue the fight against the aliens.

The Phinons, so mysterious, so implacable, so evil. Or was "evil" even a word that had any meaning

with them?

Dykstra recalled the moment when he opened up the alien drive unit for the first time. By then, he'd already had a pretty good idea of what sorts of things he should find. He was right. Now he was designing equivalent machinery out of garden variety Solar Union technology.

But as Dykstra stood looking at the Earth, he was certain that, like with much of the other examples of Phinon technology he'd examined, the Phinons had missed something obvious.

Their ship had only had one engine.

And if you turned on a hyperdrive engine inside the Limit . . . ?

Dykstra continued to look at the Earth, trying to note her slow rotation into the diffuse terminator lying across the North Atlantic and the bulk of South America. Evening was approaching in Michigan, and would arrive in a few hours. Dykstra recalled lazy, sticky summer evenings, and watching the waves break against the shores of Lake Michigan. He thought of old times, and old friends, and the heady excitement of youth in those years before the Collapse.

He had rarely found his way back there in the past century—it was time to go home again even though there would still be work to do.

Steadily, the subconscious part of his mind projected visions into the front. Even as he watched the Earth with his eyes, other eyes on the inside were showing him 4-space waveforms, deformations curving into hyperspace, oscillating, tuning to resonance. The scene faded into another, and Dykstra knew it was the shape of the field generated by the Phinon hyperdrive. He watched its evolution in time, noting how the hypervelocity vector emerged. Then he played the vision through again, this time assuming the engine was activated within the Hague Limit. The waveform vibrated erratically before disintegrating. There was no stable form for initial velocities above zero.

But . . .

Dykstra turned away to the stars, those glorious embers, sparks dusting the heavens. People would be going to them. Soon.

Unless the Phinons prevented it. That was the big question. What were these hostile aliens anyway? Were they scattered throughout the Oort cloud? If so, were they scattered throughout other Oort clouds? Was the Universe populated with the beings, or was "infested" a better term?

One problem at a time, please.

Suppose you turned on two engines? The waveforms evolved differently then. Outside the Hague Limit,

if you tuned those engines to each other just right—a tremendous increase in efficiency. *And it looks like an obvious thing to do. So why didn't the Phinons do it?*

But never mind that. Try those two engines again *within* a Hague Limit. . . .

The waveform evolved, a "ridge" appeared, a velocity vector emerged normal to the ridge.

"I'll have to consult Dr. Hague about this," Dykstra said aloud to the stars. "I'll let him do the hard calculations. Once I explain what to look for he'll spit out the numbers in no time."

* * *

"Yes, yes, Lieutenant, oh yes. The work goes along well, oh yes, the work, the research, it's all going along so well."

"Glad to hear it, Arie," Lieutenant Robert Nachteggall said. "But where's Rick? And are you two ready? I've got to have you back to the High Command by 1600 hours." They were at the System Patrol research facility in Paracelsus crater on lunar farside. Doctors Hague and Vander Kam had been working there for weeks.

Before Dr. Arie Hague could answer, Bob heard: "Hey, you're here already," and Dr. Rick Vander Kam entered the lab.

"Yeah. Arie just filled me in on things," Bob said.

"Did he show you the finished unit?"

"Oh, yes, the final product," Hague said. "A wonderful device, just a wonderful device!" He was beaming and rocking with excitement.

Rick led them over to a corner of the lab where a solid-looking packing crate sat on the floor. Its cover leaned against the wall. Inside was a cylindrical device. It didn't look like the kind of thing that would change the world forever.

"That's our puppy," Rick said. "Dykstra figured out how to build it; Arie and I perfected it. The mass converter." Rick leaned in and pointed to a projecting tube. "Run any kind of gas into this tube; molecular hydrogen, air—hell, farts if you want to—and electricity comes out of that end with the power coupling on it. The conversion efficiency is above ninety-nine percent, too!" Now Rick was also beaming, forming a close binary with Hague.

Dr. Vander Kam was in his twenties, a brilliant electrical engineer snapped up by the System Patrol to

serve a term in the research arm of Intelligence. When the aliens had been discovered, he'd been shifted onto the project to work on understanding the Phinon technology. Of lean but sturdy build, he had dull brown hair and eyes that took in everything. He was also one heir to the vast Capitol Products fortune. He could have grown up a playboy, spent his youth rocketing from planet to planet in perpetual pursuit of carnal pleasures. But Rick's pleasures came in science; his passion was for technology.

As for Dr. Arie Hague, it wasn't even clear if he was a scientist in the formal way at all. As best the System Patrol could figure out, Arie Hague had been born in the Belt, but no one knew exactly where. Autistic and utterly inept socially, it was a complete mystery as to when his incredible talents had been discovered. Some autistic, or "idiot," savants have been known to memorize and play back perfectly literally thousands of pieces of music. Others have been able to do phenomenal feats of mental calculation. Many are inordinately gifted in the visual arts.

Hague's special domain was Dykstra Field Theory and any of the technology based on it. At some point in his life, someone had taken Hague under his wing and gotten a paper published in his name, the infamous "Mistake in Dykstra Field Theory" paper. Shortly after that, the Belt military had gotten its hands on him and he nearly disappeared from the scene entirely, for the Belt had been using him to improve its weapons. Technology evolves incrementally from generation to generation. Hague was able to skip a few generations when he made his improvements.

Just a little guy was Dr. Hague. No more than a meter and a half tall, chubby, flabby, with a pointy nose and weasel eyes, a pinched face and nearly nonexistent lips. And a speech habit that could drive a man insane if he had to listen to it long enough. *But apparently not in Rick's case*, Bob thought. Rick got along with Hague just fine, not seeming to notice any longer the repetitive speech habits, probably in a state of continuous awe at the little man's talents.

"Chris is going to be thrilled when he sees this," Bob said. "Are you shipping it back to the High Command, too? This crate isn't that big. We can probably fit it into my courier boat."

Rick looked surprised. "Haven't you heard? This is being shipped down to Earth. Didn't Chris tell you?"

"I haven't talked to him in a week. Since Major Moore got the boot the brass has had me running all over the place." Bob was no longer the personal courier for Major Moore. The major had been—unwillingly—transferred back to Earth after his mishandling of Dykstra. Bob hadn't. "When I saw there was an assignment open to haul you two back to Command, I jumped at it just so I could see some familiar faces again."

"Oh. So you haven't seen Sunshine lately, either?"

Bob had to suppress a laugh at the way Rick had tried to make that question sound innocent. Sammi had cast her spell over most of the men she'd lately come into contact with. Bob doubted that she'd noticed. Clearly Rick too felt the attraction, and Bob could sympathize, being no more immune to her charms

than anyone else.

"I ran into her just before I left," Bob said. "She's still grimly pursuing her work, trying to forget she's a widow, I guess."

"She's had it tougher than any of us," Rick said. "For me, the Phinons have just been interesting technological trinkets, and monsters from stories set in faraway places. But every day she wakes up, alone, and knows she lost her husband because of them. They're a hideous reality to her. I try to understand what she must feel, but it's just an intellectual exercise."

"I think before everything is done there won't be a one of us who doesn't feel the reality of the Phinons the way Sammi does," Bob said sardonically.

Hague had wandered away to one of the benches. "Hey, Arie, c'mon. Time to get going," Rick said.

"Where's your stuff," Bob asked. "Back in your apartments?"

"No. I brought it all down to the docking bay. That's where I came from when I found you here."

Bob shrugged. "Let's go."

On the way to the courier boat, Bob asked Rick to fill him in on the move down to Earth.

"We'll be heading down to the Capitol Products black docks. That's where we're going to put together the first FTL spaceship," Rick said.

"Yes, yes, Earth. The green hills, the fleecy skies, water, water everywhere, as far as the eye can see. Yes, oh yes," Hague said.

"You're excited about going, Arie?"

"Oh yes, Lieutenant. Oh yes. Sand dunes and lakes too big to see across and campfires and wind and trees and waves . . ."

"Anyway," Rick continued, "Capitol Products has a secret construction facility located under Lake Michigan. It was built during the Belt War of Independence."

"Why did they put a spaceship facility under water?"

"Not under water—under the lake. There's at least a hundred meters of rock between the docks and the bottom of the lake. I'm not clear on all the reasons for putting one there. But all the water wiped out

infrared scans and it also provided a cheap heat sink. And they didn't want to put it off the coast into the ocean because in those days the North Americans were having trouble with other countries on Earth, and they didn't want to have to keep the navy around to protect the place."

"So you, Chris, and Arie are going to be working on Earth for a while. How long?"

"That depends on how long it takes to build a hyperdriven spaceship. Chris thinks we should use a streakbomber to start with, and just add modifications as need be. Believe you me, that facility has every advanced gizmo we're likely to need."

"Chris is looking forward to this, too?"

"He's originally from the Great Lakes region like me. All right, so he moved to California a hundred years ago, but I bet he still thinks of the area as home."

"It's the only home he has left, then," Bob said. "He's been happy since he figured out the Phinon hyperdrive, but I've caught him brooding over the loss of his house a few times."

The three walked out into the long, transparent tube that led directly to the docking bays from the main dome. Bob noticed the remains of a crashed something out near the crater wall toward the west, and another manmade crater scarring the floor of Paracelsus to the north, the only evidence of a power system that hadn't quite worked out.

Which reminded him:

"I hope this isn't a dumb question, Rick, but how are you guys going to test the hyperdrive engine on Earth, if it only works out beyond the Hague Limit?"

"That's not so dumb, Bob. We're going to do it by proxy. Capitol Products has its own research facility about 59 A.U. due solar south. We'll be designing and building components on Earth, and the team out in deep space will build duplicates and test them for us. Ideally, we should all be out beyond the Hague Limit. But then, the construction facilities aren't out there, and the Phinons have been known to attack bases out that way of late."

"I see what you mean."

They walked into the docking bay, and Bob and Rick went to retrieve the luggage from the storage lockers. On the way back, they saw that Hague, whom they'd left by the boat, had been joined by an enlisted man, who was handing the little savant a letter.

"What's up?" Bob asked.

The man saluted. "Just delivering a message Dr. Dykstra sent for Dr. Hague, Lieutenant."

Hague finished with the letter and just stood there by the entry to the boat, staring at nothing, divorced from the outside world. Rick took the note out of his hand and read it.

"What's it say?" Bob asked.

"Not much. Chris wants Arie to consider what would happen if two hyperdrive engines were operated close to each other."

"Why?"

"Doesn't say. But it's put Hague onto something. Look at him. He'll be like that all the way back to the High Command."

Rick led Hague into the boat, encountering no resistance, but no acknowledgment either, and Bob followed. Hague was placed in a seat and buckled in, and Rick joined Bob up front in the cockpit.

"That's what Arie's like when he's thinking real hard about something. Dead to the world, but, boy oh boy, just wait till he comes back to life."

They lifted from Paracelsus and the ship followed a low ballistic trajectory over the lunar surface. They were in sight of Mare Crisium when Hague uttered his first words of the trip. "Oh yes! Oh yes! Oh yes! Two, two, two. Yes, two, two, two! It works better with two. It does. It does! Yes! Oh yes! Inside the discontinuity even, it—" But he cut himself off at that point, again staring blankly.

"Looks like he's got even more to think about," Rick said.

Interlude I

"Blasted it to hell, didn't they?" Ensign Luke Johnson said, surveying the damage.

Ensign Nikki Le, the one in the petite power suit, found herself agreeing. She couldn't help sadly imagining how the station used to look—bright lights illuminating the cold, deep space iceberg, scores of parabolic scanning dishes all pointing toward the inner system, people in spacesuits flitting like fireflies around the central dome and among the bubble habitats—an island of life in a sea of frigid gloom. "Yeah. X-ray laser cannon for sure. Some of the buildings have been bombed, too."

They were hovering low over the 50-kilometer-wide potato of ice and rock, indistinguishable from the

other thousands of wannabe comets and asteroids out in the frozen reaches 20 or so A.U. beyond the orbit of Pluto, except that this one had held the Deepguard Station.

"Let's poke around in the command center," Luke said.

Nikki steered the EVA skiff toward the base and kicked in the plasma jets.

The Deepguard base was an utter wreck—not a landing deck left uncracked, not a habitation bubble left unburst, not a scanning dish left untoppled. What had once been a deep space intelligence gathering base for the System Patrol, no bigger than a half kilometer from end to end, was now wreckage spread over an area ten times as wide. And the bodies, scattered all about, some still inside broken suits, others just broken—there'd be over a hundred of them to find.

"What a mess. They never even had a chance. See the laser batteries? They're untouched. The aliens must not have targeted them because the base probably never got off a shot," Luke said.

Arriving at the dome, Nikki flew them over the top. Dome shards surrounded a crater inside. While they were looking, their ship called. "*Brachiosaurus* to skiff. Do you read, Ensign Le? Ensign Johnson?"

"We're here, Captain," Nikki acknowledged.

"Good. Sit tight you two. We have a bogey approaching at high velocity. It just popped on the screen from nowhere. It looks like one of *them*. What's that?" Captain LaBonte was listening to someone Nikki couldn't hear. Then: "Holy shit! We have another! It came out only 450 kilometers—" The link went dead.

High above the rough, bleak surface, a hundred kilometers away, the *Brachiosaurus* exploded, going up like a fusillade of Solar Union Day fireworks.

Luke and Nikki watched the death of their ship. Numb, they continued to stare at the spot of the explosion, long after the streamers of fire and incandescent dust had faded away into the eternal stars.

"We're dead," Luke finally said. "We won't be rescued out here. No one in the Patrol knows we're down here."

Nikki felt anger welling up, both at the aliens for their act, and at Luke, for stating the obvious. "I'm not giving up," she said defiantly. "Not yet. We haven't checked out all of this base yet. We might find a few places still habitable. One working food processor will feed us for two years."

They left the command center and headed for the burst habitation bubbles. Neither of them knew the layout of the base, but it was possible that the bubbles had sat atop volumes of living space buried beneath the surface.

The base was at the edge of a large, flat spot on the comet. Suddenly Luke pointed ahead, toward the far side of the plain. "Did you see that? Something just came down out there, range about 8,000 meters."

"Probably just a piece of the ship," Nikki said.

"No. It landed. It didn't fall." Luke was fumbling with the skiff's telescope controls, locking onto the position. He got the image on the screen.

Nikki glanced over. "Damn."

"It's the aliens. What did the captain call them? Phinons," Luke said, staring at the convoluted shape of the alien vessel. All odd curves and curious angles, it looked like nothing a human would design, not even Picasso on acid. As they watched, two figures emerged, moving on all fours. They stood up, reminding Nikki of rearing spiders. Their knees bent backwards like ostrich legs, and their arms looked like the legs, except that they stuck out straight up from the shoulders. Their suits were superficially like a human's, though the air tubes ran to a spot in the middle of the chest. The aliens touched controls on their midsections, then lifted gently off the surface. Small rockets fired and they started floating toward the base, a pair of arachnid wraiths.

"They have repulsor technology. Think they know we're here?" Luke asked.

"Let's not stick around to find out. They're coming to the station. We'd better be elsewhere." Nikki spun into her seat and turned them around. She had an idea. There was a deep crack ten or twelve clicks west of them that she'd seen when they made their descent to the surface.

The crack went deep, a canyon kilometers long, penetrating the lumpy mass of the comet to 1500 meters or more. Nikki brought them in just over the edge, taking them down 50 meters, grounding on an ice ledge that jutted into the abyss.

"They won't be able to see us here," Nikki said. "Those shelves above are good cover."

"Great," Luke said. "Now we'll just wait. And wait, and wait, and wait."

"Spare me the sarcasm, poster boy. We have air for a week, and the emergency rations will last just as long. We can cool our heels for a day until they leave. If they come poking around, you can play with your gun all you want. I promise." Luke had opened up the weapons chest on their way to the crack, and had been brandishing a laser rifle most of the way.

"If the aliens find us, we've got to do our best to kill them," Luke said. "We can't just run away again."

"Our duty is to survive, Luke. Not to give you a chance to be a hero."

"That's enough of that shit, Nikki. I'm serious. If they find us, we can't let them get back to their own people to tell them about us. They've had almost no contact with humans face-to-face. The one time they did, one of them was killed. It's very important that the aliens know we're dangerous."

"You're forgetting that we know almost nothing about them, either. Deepguard was a monitoring station. Given time we can fix up a transmitter. It's more important that we survive to get what we know of them back to our superiors, whether the aliens think we're cowards or not."

Despite the light amplifiers in their faceplates, their surroundings consisted of gloomy masses, dark gray blobs against a background of black. "I wish we could turn on the lights," Luke said. "This ice canyon would be beautiful in Rocky Mountain sunshine."

As if on cue, the canyon flashed into brilliance, dazzling them in the fraction of a second before the light amplifiers kicked out and the faceplates polarized and darkened.

"Sit tight!" Nikki ordered. "I may have to move us out of here fast."

"It's a flare," Luke said as the actinic blaze dropped into view on a slow motion plummet to the depths below.

"They must have spotted us when we left the base. And I was right," Luke whispered. "This ice *is* gorgeous when you shine a light on it. I doubt they've seen us yet, though. You parked us in a good spot."

"Accolade accepted, but quit admiring the view and grab the guns." Luke hefted his weapon, retrieved one for Nikki, checked the charges, handed one to her.

"Have you ever used one of these, Nikki?"

"I've had the same training as everyone else."

"That's not what I meant. Have you ever *used* one—fired at something when it counted?"

Reluctantly, she admitted she hadn't.

"Then set it to continuous beam," Luke told her. "And wave it around at your target. You'll eat up energy, but you're more likely to hit something than if you use pulse mode."

Nikki made the adjustment. "What about you?"

"I've hit things when it counted," he said.

Nikki looked up, trying to see if anything was hiding against the background of shadow and dazzle. There! "Something moved!"

"Where?" Luke raised his weapon looking for something to aim at.

"Up high on the far side, by the wall. See? It moved. It's one of them, coming down." Nikki turned on the repulsors, felt the slight tremor in her butt as the field lines were twisted into lift mode.

"I see it." His rifle up, Luke drew a bead. But before he could fire the alien pushed away from the wall with all four limbs like a jumping spider. It sailed rapidly across the gorge, twisted around, and fired a weapon.

In silence the ledge disintegrated under them, shards of ice shattering into space. Luke was almost torn off the skiff, managing at the last instant to grab the side with his hand, needing all of the power amplification to hold on.

They were falling, ever so slowly.

"We'll be okay," Nikki said. "The repulsors are on." Jets fired. "I'm taking us deeper."

"Right," Luke said, regaining his seat. They descended for long moments, then their flight path leveled out.

Nikki said, "I'm taking us a couple of clicks along the bottom before we climb out."

"And go where?"

"I don't know. The base maybe? You got any bright ideas?"

"Truthfully, I thought this crack *was* a good idea, at least if we were going to hide. We're probably going to have to fight them after all. But we might as well beat them to the base and see if we can hold out there."

But after a quick search of the base, they had found no additional food or weapons. "Doesn't look so good, does it?" Luke said.

"No," Nikki agreed. "I guess waiting for rescue is moot." She sighed, dejected. She hadn't wanted to believe that their option barrel was this empty. Their prospects looked more than just bleak.

"You can take the skiff up and crash if you want," Luke said.

"It would be quick that way."

"Yes, it would. Be my guest. But I have work to do before I check out," he said grimly.

"What are you going to do?"

"There are two aliens out there I'm going to kill."

Nikki said, "Count me in."

"Good," Luke said. "I really do need you for the plan I have in mind."

"Plan?"

* * *

Luke had gone up to the fractured rim of the command dome to watch the horizon for the approach of the aliens. In a dark tunnel below the surface, Nikki picked her way through the toppled bunks and furniture, shining her suit beam into hollows and dim spaces. She had gone down below since they still had a few minutes before they expected the aliens to arrive. She wanted to search here, one of the few places left they hadn't looked into. The carnage was hideous. Nikki had already found a dozen more mangled corpses. Two, a man and a woman, were clenched in a dead embrace. She tried not to think about their story.

"Get up here, quick!" Luke said over the comm. "I see them. They're gliding over the surface, coming this way."

Nikki started back, relieved to be leaving the death behind her, yet afraid of what lay ahead. "Did they spot you?"

"How do I know? But I doubt it. Anyway, it's showtime."

Nikki emerged from below, hopped over a pile of rubble, and stood beside Luke.

"Ready?" Luke asked.

"Ready."

They went into the center of the dome, just to the edge of the bomb crater. The plan was simple. Nikki,

being the smaller, Luke camouflaged underneath the rubble, laying shards of wall material over her, with just enough of an opening left to see and shoot through. After, he concealed himself behind a wall and waited. They wanted the aliens to spot his position first and concentrate their fire there. Then Nikki could pick them off.

Luke scanned the jagged top of the dome wall.

"Okay, kiddo. The second they clear the wall, let 'em have it," he said. "And let's hope they come over this side."

One did, one didn't.

Nikki heard, "Oh, dammit!" over her comm as one alien floated into view. She fired, the laser on continuous beam, just as Luke had told her. She waved the beam through the target. The Phinon, caught in the beam, flipped over, returning fire wide of Nikki's position. Then its repulsor was hit and it fell slowly to the surface.

"Bastard got me," Nikki heard.

Nikki flung off her camouflaging debris, jumped up, looking, tense. She didn't understand how Luke could have been hit. Her Phinon was lying in the rubble, flopping and writhing, bouncing in the low gravity.

She spotted the second Phinon. It was hovering over the dome. Luke stood by the wall holding his left shoulder.

His arm was gone. His rifle lay on the ground.

"Luke!"

"We're dead, Nikki," he gasped.

The Phinon had the drop on them. It seemed to be calmly taking in the scene. Or was it? *How come I keep thinking of a deer frozen in the road, dazzled by headlights?* Nikki thought.

Suddenly, with a flash of suit jets, the Phinon bolted toward its ship.

Nikki rushed to Luke. "Son of a bitch came from the other way. Damn, this hurts!" Luke said. Nikki stood by him, looking at his injury. The suit's trauma units had neatly sealed off the shoulder. Diagnostic lights on the medical display glowed green.

"The painkillers should kick in soon. You're going to live," Nikki said.

"For how long? You've got to stop him, Nikki. You can't let him return to his people."

"You're hurt."

"Don't worry about me, dammit! He's getting away."

"Why didn't he kill us?"

"That's how they behave. Remember the briefing? First in the Oort cloud. And that second ship fleeing from Slingshot."

The remaining alien was still tossing and flopping. "He didn't even help his friend."

"Maybe they don't know what friends are," Luke said, retrieving his laser. Viciously he played it over the downed Phinon. It gave a final convulsion and lay still. Luke whipped back to Nikki. "The joy juice is kicking in. I'll be fine. Take the skiff and go after him!"

Nikki hopped the wall and jumped into the skiff. In seconds she was racing toward the alien ship. The Phinon was easy to find. It wasn't making any attempt to cover its flight, just flying straight and true. In the far faster skiff Nikki drew to within 50 meters. She set the skiff to autopilot. She stood with her laser and took aim.

The Phinon noticed. It dodged, started flying a drunkard's walk zigzag, though still getting closer to its ship. Nikki fired, missed, fired again, to no avail. "It's no use. I'm no marksman. I'm a pilot. *So pilot!*"

She resumed control of the skiff and punched it. The Phinon never fired, never looked back, as she picked her moment and rammed.

It took the flight out of both of them. The Phinon lost repulsor control, started helixing, flying wild loops. Its weapon went flipping away. It shut off its flight unit and hit the surface, ricocheted, bounced, and skidded to a halt.

Nikki had problems of her own. The collision had wrecked a stabilizer. She fought the skiff for a minute, but it started tumbling. Gear fell out—ration packs, water, and even her laser were scattered away. She finally got the skiff down in one dented piece.

She was between the Phinon and its ship. It was coming toward her, moving fast in long, flat hops, using all four limbs.

Nikki stood her ground.

The Phinon came closer, bearing down, was almost upon her when it took a high hop and tried to hurdle her.

"Oh no you don't!" Nikki said and launched herself in the low gee, the power suit making her a potent missile. She crashed into the Phinon and held on, gripping him around both legs. The power of her jump sent the pair in a high arc above the surface.

The alien struggled violently. Though her suit gave her the raw strength of five men, for her it wasn't enough. The alien's steel skeleton driven by organic hydraulic pistons made it incredibly strong. Protrusions on the limbs where tendon rods connected gave it a huge mechanical advantage. It pried and twisted itself out of her grasp.

It's like wrestling a piece of road equipment! Nikki thought.

The Phinon finally kicked itself free and the laws of low gravity ballistics brought them slowly but inexorably to the surface. The alien landed in stride 20 meters ahead of Nikki and resumed the race to its ship. Nikki picked herself up to follow, tried to take a step, fell. Her right leg wouldn't work.

"Shit! Damaged the power couplings." Unpowered, moving her leg was like walking with a concrete block tied to her foot. She couldn't pursue; her gun was gone. Nikki watched helplessly as the alien reached its ship and entered.

"I'm sorry, Luke," she whispered. "I couldn't stop him."

The tail of the alien craft lit up in a creamy glow. It started to rise on repulsors.

Then her faceplate polarized as a blazing green spot appeared on the side of the ship, remaining there even as the ship accelerated. Two hundred meters up, it exploded. Nikki ducked and covered as shrapnel and debris pelted down around her.

"Got him! Nikki? Nikki? Are you okay? I made it to the laser batteries."

"I noticed," Nikki said. "Good thing. I couldn't stop him, Luke."

"But you slowed him up. That was enough."

"How are you feeling?"

"At the moment, fantastic," he said.

Nikki began her gimpy return to the skiff, taking long, poorly coordinated hops with her functional leg. "I'm coming back to the base," she said. "But it's going to take a while."

"We have the time," Luke said. Then: "Y'know, we could send a message with this laser. We might be rescued after all."

Something high above the surface caught Nikki's eye. A movement. A shimmering line of white appeared for an instant, then was gone. A second Phinon ship going FTL? *Running away, the cowards*, Nikki thought triumphantly.

It was then that she saw the flickering line of a projectile speeding toward the surface, and intersecting the horizon at the Deepguard base with a cold explosion.

"Luke! Luke!" she screamed into the comm.

To no avail.

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Dykstra enjoyed his visits to Sammi's lab. The bulk of his own life had been spent in the areas of physics and high technology, and in those fields it was difficult to find anyone who could teach him something really new. More than once he'd attended seminars by bright, up-and-coming physicists where they'd been trying to describe their latest theoretical approach to some old problem, with all the confident self assurance of youth, only to find that the bright young person had merely rediscovered an idea that Dykstra had heard before, when some other bright young scientist had arrived at the same idea—maybe forty years before.

But outside his own fields he could routinely come into contact with other new stars with genuinely fresh ideas, or at least with ideas that were fresh to him.

Sammi was one of those stars working in the new world of genano engineering. Her name was not known outside her field, not yet anyway. But Dykstra was certain that she'd be heard from, that given time she would inevitably be recognized as one of the top practitioners in the field. He'd seen her type before.

No, not exactly her type, he corrected his thought as he entered the lab, cane gently tapping on the floor. There was something else about Sammi that made her special, something ineffable, but possibly sublime. He didn't know what it was though. Certainly, she had the same shininess of spirit that his dearest friend Jenny had also possessed, and with Sammi he felt that same kinship of similar souls. But there was more, too.

Perhaps much more.

The lab was the same as always, cluttered with high tech nano-manipulating equipment, and every device decorated with fingerprints and odd, sticky residues from spills of those sort of biogoops the biology types dealt with. Dykstra tried to make it down to the lab every few days, particularly since Sammi had a habit of burying herself there.

In the back alcove where Sammi kept her workstation, Dykstra noticed a flickering light coming out of the room's dimness. That would be her computer screen. He walked over and saw the recording of Sammi's experiment with the Phinon femur being played. The scientist herself he found with her face flat on the desk, sound asleep.

Her golden hair lay scattered over the desktop, entangled with a stylus, offering a nesting place to the mouse. Her lips were parted slightly, and even though she was sleeping, Dykstra could see the laugh lines that her smile had long ago engraved upon her face. But there were other lines, recent acquisitions, around her eyes. Lines born of stress and overwork. And grief.

He almost turned around to leave. She needed sleep more than she needed to make conversation with him. He lifted his cane, would walk without it out of the lab. In so doing he momentarily lost his balance, reached out a hand to the table to steady himself, and knocked over a small specimen rack.

"Huh? What?"

"Good morning, Sunshine. Although actually it's evening. Sorry I woke you," Dykstra said.

"Oh, man," Sammi said. "I can't believe I fell asleep. I have so much I need to do yet." She stretched, reaching high above her head and arching her back, which made obvious feminine features which even Dykstra was not too old to notice. "And with big brother watching, too." She gestured toward one of the ubiquitous security monitors. "I've got to get back to work."

"What's that you have playing on the screen?" Dykstra asked.

"That," she said, "is the video record of my latest, circa last week, remarkable success. I hope. Actually, I'm running into some problems I can't see my way around." She explained to him the details of the experiment with the femur, pointing out that she was pleased with the speed at which the bone had disintegrated. "But I can't seem to get the bugs to reproduce properly," she added.

"What characterizes the problem?" Dykstra asked.

"Where do I begin?" she said. "My original bugs were supposed to live in the Martian soil. I've gotten this particular strain of bacteria to live in Phinon tissue, so the viruses can use them to reproduce. Given time and a supply of live Phinons I could probably tailor a virus that will reproduce within Phinon cells, but why not just wish for the Moon?"

"I gather the problem isn't with the virus side of the symbiont?"

"Yes and no," Sammi replied. "I can get ideal reproduction rates of the viruses, but I can't get them to duplicate their tools properly. In a proper setup, the bacteria should live in the Phinon, and the viruses should reproduce in the bacteria, but not just themselves—their tools also. But they won't. To do the femur experiment I supplied them with premanufactured nanotools. The results were gratifying. But they'll have to make their own when they're out there infecting aliens. And I can't see how to get them to do it right now."

Dykstra laid a gentle hand on her shoulder. "What's getting in your way?" he asked.

"I don't know. Stress. Overwork. But mostly it's just that I don't have a live alien to work with. I keep guessing and counterguessing the parameters of the environment the genanites will have to thrive in, and then I rapidly get overwhelmed by the possibilities. The other biologists have their own problems to

work on, and I'm still the only genano engineer here." She mock-collapsed back onto the desk. "What am I going to do, Chris?"

He looked at her, and deadpan, said, "I would recommend a party."

"What?"

"Sunshine, you've been hitting it way too hard. It's time you got a break from this. I'm having a small get-together in my suite tomorrow night. Lieutenant Nachtegall will be there, as will Drs. Vander Kam and Arie Hague—"

Sammi shook her head, protesting. "I'm just too busy."

"You're spinning your wheels."

She'd been staring at the screen again, then she turned to him and there were tears in her eyes. "I'm . . . I'm not ready yet, Chris. I'm just not ready."

"I'm sorry, Sammi," Dykstra said. "But I really have to ask you to force yourself. I need you to come. We have some things to discuss. Some very important things. But I don't wish to discuss them now."

"So you *need* me?" She didn't really believe it.

"And I also wanted to say good-bye."

"You're leaving?!" Her eyes betrayed the look of a child about to be abandoned.

"For a while, Sammi. Only for a while. I'm going back to Earth. Probably for only several months, if all goes well. Rick and Arie will be going with me. The lieutenant will have to spend some time with us, too, but he'll be able to travel back and forth."

With exaggerated determination, she shut off the replay, turned off her workstation, and got out of her chair. With resignation she said, "I need to get some sleep. Who am I trying to kid, anyway? I'm not getting anything done here."

"A wise decision, Sunshine."

"When are you leaving for Earth?"

"The day after tomorrow. Early."

"I'll be at the party," she said.

* * *

Whenever Colonel Knoedler needed to think real hard, he found it necessary to put himself in the proper mood, and this was most easily accomplished by reading the right book. Since most of the things his position demanded he think about involved strategy and tactics, the two books he most often turned to were Herman Kahn's *On Thermonuclear War*, a classic from the middle of the last century, and Potapov's *Kasparov vs. the Computers: The Complete Games*.

At the moment he was seated in his favorite reading chair, a leather recliner, sturdy, functional, in a style that would never be flashy but would never go out of fashion either. There was Tchaikovsky in the air. The worn, red covers of the Kahn book were between his fingers, but his eyes were not focused on the pages. The book had already done its work—the colonel was thinking. Hard.

The Phinon attack in the Oort cloud had come over two years ago, but the OEV 1 had actually gone out to them. Now in only the last few months the Phinons had come closer to home and struck three times: Slingshot, Glacierville, and a few days ago, Deepguard.

Deepguard. That one was extra troubling. How had the Phinons even found that base? It was a passive viewing and listening post from which the entire Solar System could be spied upon, and not an easy thing to detect. He'd seen a photo of the girl they'd rescued from there. Nikki Le. Very pretty oriental lady. Knoedler had always liked oriental women. She was on her way to Luna right now.

Too bad he'd always had so little time for women.

His train of thought was in danger of derailing into images of himself, Nikki, and white picket fences when he wrenched it back to the situation at hand.

Dykstra had dropped his bombshell today to the Joint Staff. He'd told them he knew how to build a reactionless sublight drive that would work inside the Hague Limit, and that the Phinons had never invented it themselves.

Oh really now?

Knoedler put down the Kahn book and picked up the chess one.

The colonel's rooms at the High Command were efficiently furnished; several chairs, a couch, bookshelves, a table at which to eat or work, the usual computer workstation. But there were few pictures and no plants, and not even a single one of the numerous plaques and awards he'd received in his career adorned his walls. The only genuine decorations he had were his chess sets. Three out of his collection of more than a hundred were on display: one of gold and silver on a shelf; one of precious

stones on a side table; one of pewter spaceship pieces on a gaming table, the only one that he'd actually play games with. Dykstra had had a collection of chess sets, until the Belt blew up his house.

The Phinons had him in one hell of a chess match right now. The raids happening on the trans-Hague Limit assets were little pawn thrusts. The ships congregating out in deep space, leaving hyperspace but not reentering—that had to be where the real strategy was shaping up.

And Dykstra's going the Phinons one better? Was the old genius really that good, or were the Phinons employing a gambit?

It had taken Dykstra only two months to go from thinking FTL travel was impossible to duplicating the Phinon drive. Less than two months after that he'd come up with tremendous improvements.

Had the Phinons maybe wanted it to be this easy?

Although he'd cracked open the chess book, Knoedler had yet to read a line from it. The Tchaikovsky had ceased playing.

What kind of a chess game is this? They can see my pieces, but theirs are invisible. They can see my possible moves, but theirs I can't consider until after they've made them.

Colonel Knoedler was a marvelous chess player. Against weaker opponents, he'd readily exchange pieces, simplifying things until he could put together an elegant checkmate. The few times he played someone of equal caliber, or more likely, had gotten careless and fallen into a perilous situation, he'd play for complications, trusting that his wit and skill would ultimately carry him through if he just had time enough to pick away at his competition.

In this situation, I most definitely need to play for complications.

Dykstra had already argued to the staff that once the first FTL ship was ready, they should take it deep into the Oort cloud and gather information on the aliens. But would any information gathered be more valuable to the Patrol than the knowledge that humanity had developed its own FTL capability would be to the Phinons? And God forbid that Dykstra was right, and the Phinons did not know how to build sublight drives that worked within Hague Limits, and they captured our first ship and reverse engineered their way to that technology.

There would be another meeting with the staff tomorrow. Knoedler knew he would argue vociferously to keep the new ship close to home.

But something else was nagging him about that new drive Dykstra had invented. It could become a major piece in an earlier puzzle the colonel had been working on. *But, oh, "our new buddies," the Belt, won't like this at all.* Although the BDF and the System Patrol had agreed to a cease-fire while the

Phinon problem was assessed, the Patrol had not revealed the existence of any of the new technology they'd already developed.

Knoedler put down the chess book finally and went to his bookshelf. He took an old Bible out and returned to his chair. He opened it to I Kings, then flipped pages backwards all the way into II Samuel before he found what he was looking for.

And then, several times, he read the story of David and Goliath.

* * *

Mare Tranquilitatis, the Sea of Tranquility, was perhaps the most appropriate place in the Solar System to put a cemetery. Here lay thousands upon thousands of men and women who'd died in space in the service of the System Patrol. Black crosses, stars of David, symbols from other faiths, and plain rectangular markers for those who'd had no religious convictions, spread out in perfect alignment all the way to the horizon no matter which way one looked from the landing field in the center of the cemetery. Among those buried here were genuine heroes of the 21st century, men and women whose names were household words, but their markers were no different from those of the lowly belowdecks cannon fodder that had met their ends in their bunks.

Which was why Sammi would have needed a map to find again the spot where Steve's marker was placed. There wasn't any body buried there in his case, of course—there hadn't been one to return to her.

She'd thought about what Dykstra had said to her the day before, and knew he was right—she was working much too hard, and she hadn't allowed herself a genuine catharsis since that night he'd shown up at her apartment to tell her what had really happened to Steve. So she'd taken this morning off to visit the cemetery, her only time back since she'd watched his marker being emplaced.

She was riding in a little open scooter that the cemetery provided for visitors to use among the markers. The repulsors on the scooters only allowed them to rise ten centimeters off the surface, and there was absolutely no way one could get them to kick up dust short of killing the power and letting them crash. Sammi was mildly surprised at how comfortable the scooters were even for a person in a spacesuit. And the scooter knew how to find section GL-8088.

There was almost no one out there this morning. Sammi had seen only two caretakers at the landing field and the man who'd given her the scooter. As she rode along, she'd seen only one other scooter along the way she had come, and another some ways ahead of her, so far away she could barely see the person standing next to the marker that the scooter had stopped beside.

I don't know why I came out here, Sammi suddenly thought. *What do I think I'm going to find, anyway? Emotional release? I've done all my crying. Renewed conviction that working for the Patrol is the right thing to do? That would be nice.* She looked over the acres and acres of markers. *But I won't find that*

here, either.

Her scooter was getting closer and closer to the one she'd seen up ahead, and then she realized that it was grounded at Steve's marker. At first she thought maybe one of Steve's suicide orbiteer buddies had stopped to visit, but she didn't recognize the insignia on the suit.

The scooter stopped and she got off. The man noticed her, smiled at her through his faceplate, and she returned the smile.

"That smile," he said. "You're Sunshine. Steve's wife, I mean. My God, he wasn't lying about how you got that nickname."

"Yes. I'm Samantha MacTavish. I didn't get your name."

"Forgive me. I'm sorry. Been out in space too long," the man said. He was a mature-looking black man she could see from his face, but his posture revealed a man of strength and vigor. "My name is Roger Tykes. People call me `Pops.' Steve called me `Pops.' "

"I could have guessed," Sammi said. "He told me about you in his letters. He was in awe of you."

"Shucks," Pops said. "I've never done anything to match what your husband did. Hell, I'd be dead now if it wasn't for him. I figured I'd better pay my respects while I'm on Luna. I don't usually come to the inner system. Don't know when or if I'll be back."

Something doesn't seem right about Pops, Sammi thought. He was talking too much, which wasn't what she'd expected from Steve's description of the strong, taciturn, father figure that Pops had been to the men under his command. She looked at him more closely, and through the faceplate saw the streaks of tears on his cheeks that the proud commander had been unable to wipe away.

And Pops knew his secret was out. "All right, dammit. I admit it—I was crying. Practically like a baby before you got here. I *owed* him that. There aren't that many people I've met who deserve to have tears shed over them when they're gone, but, by God, he was one of them! Those alien bastards . . . those alien bastards . . ." Then he turned away from her and shut off his mike for a few moments.

Sammi stood there silently, taking in the cross marker, the harsh shadow it cast upon the surface, and the figure of the old soldier standing straight and silent nearby, paying his respects not just to a man, but to a kind of man.

And for the first time in months, she felt her emptiness filling up with something warm. She didn't want to analyze it—she just wanted to feel it.

Finally Pops turned again to face her. "I've got to be going, ma'am. I'm very pleased to have met you."

There was iron in his voice now.

"Me, too," Sammi said.

* * *

Bob met her at the door and led her in. The gravity in the room was set at half standard, just the way Dykstra liked it.

They were all there as promised. Over by the autochef, helping with the drinks, stood Dykstra and Rick Vander Kam. By himself, but savoring a hot chocolate flavored with just a splash of scotch, sat Hague. And by her left arm, close, but not too close, hovered the lieutenant.

He wasn't going to get anywhere with her, not tonight, probably not ever. She was sure of that. She did sneak a side glance at him, noting once again that he was gorgeous, with a solid body displaying the classic V from waist to shoulders, and his close-cropped curly gold hair. But the part of her heart that could love was still solidly surrounded with an ache that wouldn't go away, no matter how hard she worked, no matter how hard she tried to get on with her life.

She remembered the first time she'd come to Dykstra's apartment. Then, she'd been awed in the presence of the Genius of the Age, but only at first. His cool demeanor and friendly manner had set her at ease, and apart from his legend, he was, at core, a lovable old man.

She snapped back into the present when Dykstra came over.

"Sammi, I'm glad you came. Now our circle is complete," he said.

"But soon to be broken. Why didn't you tell me until yesterday that you're all going off and leaving me behind?" she asked.

"*I'll* still be around," Bob said. "Some of the time, anyway."

It wasn't much as parties go. There was an exchange of small talk, and Rick gave her a hug she didn't expect, but also didn't really mind. Even Hague joined in, though with all his usual surplus of "Oh, yeses." After ten minutes of this Dykstra had them all take a seat, and he started to tell them what this "party" was really all about.

He sat before them in his comfy chair. He held his walking stick in his right hand, almost like a scepter. But no, kingly images didn't fit Dykstra, Sammi thought. It was more like she and the others were sitting on one end of a log, and Dykstra was playing Socrates on the other.

"I'm going to tell you what the future holds," he said. "Or what it can hold. All of you are necessary to make it happen.

"Tomorrow, Dr. Hague, Dr. Vander Kam, and I are going to Earth, there to work at the Capitol Products spaceship yards. When we are finished there, we will have produced humanity's first faster-than-light spacecraft. But here's the thing—our first try is going to be superior to anything the Phinons have."

"That's news to me," Rick said. "What makes you think so?"

"Two engines, yes, two, so much better, so much," Hague piped up. "Reactionless sublight effects, too. Oh yes, oh yes."

Rick just smiled. "You guys have been holding out on me."

"I only figured it out a short time ago," Dykstra said. "And I wanted to bounce the ideas off Dr. Hague, have him do his magic at calculations on the equations. What we figured out is that using two of the FTL engines, properly tuned to each other, allows a doubling in the efficiency of making the transition to hyperspace. Why this should be the case is obvious when you understand the physics. Why the Phinons never seem to have figured it out is a mystery."

Sammi asked: "Does that mean our ship will be able to travel twice as fast as theirs do?"

"No. Hyperspace doesn't work that way. It means that it will only take us half as much energy to get into hyperspace. Two engines, or more properly, two drive elements, means half the energy consumption. And before you ask, no, it is not the case that three would be even better."

"No, no. Two is best, is just right. It has to be two, yes, it has to be two, oh yes. But, oh, the reactionless effect. Oh, yes!" Hague put in.

"That's the kicker," Dykstra continued. "If you use these two elements in normal space—inside or outside the Hague Limit, it doesn't matter—just the right way, you can get a direct conversion of mass into kinetic energy, and you get to choose your velocity vector. It's uncanny. But I haven't seen any evidence in the Phinon engine that they know anything about this effect."

At the mention of the Phinon engine, Hague gave a visible shudder. The savant was a whiz with human technology, had stored in his brain the entire contents of scores of parts and equipment catalogs, could repair and improve almost anything ever invented. As long as it was human. His revulsion for all things Phinon, the sense of innate wrongness about them, drove him into a frenzy whenever he was forced to be near any of the alien artifacts. But Dykstra had recast the alien technology in human terms, and with that Hague was perfectly content.

"So let me describe what's going to happen, maybe as soon as three months from now," Dykstra

continued. "Our modified streakbomber is going to depart from Earth without even the hint of an exhaust jet, and speed on its way to the Capitol Products base outside the Hague Limit. From there, the ship and her crew will become the first from this race to vault into hyperspace. What happens after that is up to us, and by us I mean just we few in this room, and one other whom I won't name yet."

"You're making this mysterious, Chris," Bob said. "Just what is it you have in mind? What's *supposed* to happen is that once our ship gets outside the Hague Limit, it's to undergo a series of tests, and they'll probably take months. You don't like that, do you?"

"Not one bit," Dykstra confirmed. "By the time our ship first jumps into hyperspace, the last thing we'll need will be more tests on the craft. What we will need is information on the Phinons.

"And maybe a specimen or two. Preferably living, right Sammi?"

"So now I find out why I'm here," she said. "You want to go capture some aliens, and you don't think the Patrol is going to go about it fast enough, do you?"

"You told me earlier that you really need a living specimen to confirm the value of your work. Does it bother you that I also came to that conclusion some time ago?"

"No. It makes sense. But I wonder why the Patrol hasn't made it a priority. I mean, given that we're going to have a ship actually capable of going after the Phinons any time we want to, I'd have thought capturing specimens—or hostages, whatever—would be an obvious thing to do."

Dykstra sighed. "It is, but there are other considerations. Since Major Moore was sent back to Earth, I've essentially become the head of the alien technology and studies group. But I don't carry any exceptional clout in the rooms where strategy is discussed. And there are essentially two competing views about how to deal with the Phinon threat.

"My view is that, though we know very little about the aliens themselves—their motives, their plans, this ongoing question of their 'souls'—we do know enough about their technology to conclude that they are only a short distance ahead of us in some technical fields, and probably behind us in others. For instance, we've yet to find any evidence that they have nanotechnology or genano capabilities. If it is the case that they are as I've painted them, then our strategy is straightforward. We fight them ship-to-ship, bomb their bases, find out where they are and go after them, and design nasty weapons like Sammi's rust bugs."

"I thought that pretty much was the only view," Bob said. "What else are people thinking of doing—cease-fire talks?"

The group laughed, except for Hague, who had wandered back to the autochef and was getting himself another drink. Dykstra said, "The Patrol doesn't have any diplomats, so that suggestion hasn't come up.

But have you heard of a Colonel Knoedler, Bob?"

"Colonel Tommy? Sure. He pulled himself up through the ranks from enlisted man. They hold him out as a model for new recruits during boot camp. What's his view?"

Sammi watched the old genius as he stood up and began pacing before he answered. She got the impression that he found the opposing view not just wrong, but personally troubling as well. Nevertheless, he resumed the discussion.

"I don't want to unfairly characterize Knoedler's position," he began. "I've met the man. He does seem to merit the honor he's paid among the recruits. But his ideas are not particularly flattering to me, and the influence he wields in the strategy group is leading to delays and what I think is a foolish level of pseudo-caution that I feel could be dangerous to, well, humanity."

"As bad as that?" Rick asked, rhetorically.

"In a nutshell, the colonel thinks that we're the victims of an ingenious ruse on the part of the Phinons. He feels that this alien technology we acquired from their ship and their implements, and our subsequent mastery, has all come too easily. He thinks the Phinons wanted us to develop our own FTL technology, to the point where we become overly dependent upon it, and then perhaps they'll trot out some sort of super weapon that will, to use his words, 'take us out in one blow.' "

"Oh, right!" Bob hooted in derision. "Like you'd give aircraft technology to savages just so you could shoot them down later with surface-to-air missiles. If you have that kind of technology and they don't, then why bother?"

Dykstra smiled, obviously gratified by Bob's outburst. But he said, "It's not quite as simple as that. It is possible to conjure up a scenario that would work for them. Suppose they have a weapon that, say, causes spacecraft in hyperspace to disintegrate. And suppose the technology of that weapon is not readily derived from the FTL technology. We could then assemble an armada of FTL spacecraft and send it on its way, only to have the Phinons destroy it easily. Not only would we lose the fleet, but all of that time and effort and money that went into creating it."

"Do you think that's likely, Chris?" Samantha asked.

"No. For one thing, I wouldn't trust us not to figure out the secret of the other weapon and develop a counter. And there are other considerations . . ." he said, but he trailed off, and seemed to be thinking about something.

"I have a dispute with the idea that we acquired the technology too easily," Rick piped up. "He's selling you short, Chris. I was working on the Phinon stuff before we called you in. We were hopelessly befuddled. I know we wouldn't have figured out the mass conversion trick. And as for the theory of FTL

travel . . . Well, I've read your reports, and I don't think I'll ever understand them. I know you taught Arie how to do the math, but I don't think he really understands the physical principles involved. And besides you two I doubt if there's anyone else in the whole Solar System who could begin to understand hyperphysics."

"Thank you, Rick," Dykstra said.

"I'm not saying it just to be nice. For Knoedler to be right, it would require the Phinons to know that we had a James Christian Dykstra on the scene to figure things out for us. I don't see how that's possible."

"There's something else though, isn't there, Chris?" Samantha asked. "You think you've figured out something about the Phinons that no one else has, and that's why you're willing to have us—what? Violate orders and steal the first FTL spaceship to do things your way."

They all looked at Dykstra then, even Hague, and waited.

"Yes," he said. "I have been pondering their technology, burying myself in it. I've tried to think like they think, tried to reconstruct the pathways by which they arrived at their level of physical understanding, because presumably they didn't have the technology fall into their laps like we did. I've marveled at their astuteness in some instances, and been dumbfounded at their blindness in others.

"I don't know for certain, but I'm fairly sure that I do know what they are. But I can't very well walk into the strategy room and explain to the generals that the Phinons have no souls and so Knoedler's concerns are simply anthropomorphic paranoia."

"No, I guess not," Sammi said ironically. "But are you going to explain it to us?"

"In time I will," Dykstra said. "But you're right, Sammi. I'm asking all of you to commit what will be called treason by some if things turn out badly. It's not by convincing you of the logic of my view about the Phinons that's going to get you to agree to do this. After all, I might be wrong. It's . . ." he stammered, unsure of what to say next.

This is hard for him, Sammi thought. He's used to explaining everything in full. And he's too kind to say we won't understand his explanation. He doesn't know how to ask us if we'll just do it out of faith. She made it easy on him. "I'm with you, Chris. Just tell me what you want me to do. You told me about Steve even when it could have gotten you sent back to Earth in disgrace. I owe you."

"I was there when you faced down the major," Rick said. "I've seen what you can do. I'm in."

"Me, too," Bob said. "I don't think I owe you anything, and I'm not bright enough to appreciate your intelligence. But you're a rarity in another way, Chris. You're a genuinely good man. I've met very few."

"Thank you, my friends," Dykstra said. "But there is one voice we have yet to hear from. Dr. Hague?"

Hague was still at the autochef. He was lying on his back on the counter, surrounded by a dozen glasses of hot chocolate, which ran the range of color from a nearly black, high concentration chocolate, to an almost white, fifty-fifty marshmallow/chocolate mix. He had the cover off the guts of the machine and was tinkering with it. The others had noticed what he was doing earlier, but they'd long ago learned to let Hague be Hague.

At Dykstra's call he stopped his work momentarily, looked at them all, and without a redundancy of phrase or a surplus yes, said, "You are my friends. I'm in, too." In that instant Sammi thought he looked solemn, thought she caught a glimpse of the Arie Hague that could have been had he not been caged by the cross-circuitry of autism. Then his ready smile returned and he gleefully turned back to the autochef.

* * *

Sammi was the last to leave. Dykstra had told her he had a few additional things to discuss.

"Once the others leave in the ship, Dr. Hague and I will return to the Moon. But while we're gone, there's something I'd like you to see if you can work on. We'll probably need a way to keep a Phinon unconscious if we're to bring any back alive."

"That shouldn't be a problem, Chris. Have you been keeping up with the biological work?" He shook his head no. "Well, they've figured out where the brain is. It's distributed throughout the body. Little knots of brain tissue are locked away inside cavities in the bones, and they're all tied together by specialized nerve cells. But apart from the odd geometry, the brain material itself isn't much different from terrestrial types."

"I see. So you think we may already have a serviceable knockout drop?"

"Promenidepromaine. PMDP. The stuff will put out anything from an elephant to a jellyfish. My guess is it will work on Phinons, too, but I'm going to have to think over what the dosage should be. I'll have to tell you about that later somehow—some way that we won't be found out."

"That problem is solved. Lieutenant Nachtgall will visit periodically. You can convey your findings to me through him."

"Okay," Sammi said. But she wasn't ready to leave yet. "I have something else I want to ask you."

Dykstra looked at her, seemed to be looking into her, and said: "I expected you would."

"Why?"

"You remind me of someone. Her name was Jenny. She would have had some things to ask me, too."

Sammi smiled at that. "Do you know what the question is?"

"I'm not *that* good," Dykstra said, smiling.

"Did you really worry that any of us wouldn't go along with you?" Sammi asked.

"It's a big risk," Dykstra replied. "The Patrol will come down hard on us if they find out what we're going to do. Our only hope of avoiding jail time or perhaps even execution is if the men return with something valuable. I would understand if someone didn't want to go along with that."

"But you knew all of us would, didn't you? We all gave you our reasons, I know, but you really don't think that's the whole of it, do you?"

"No." This time he looked at her with soft and approving eyes. "You and the others are feeling something, and I feel it, too."

"Is it supposed to include feeling that Steve died when he was supposed to?" Sammi asked, and a tear rolled down her cheek. She didn't wait for an answer. "As much as I loved Steve, as much as I miss him terribly, I . . . I . . . can't get the thought out of my head that his death . . . that in some way it was important to the Universe that he die exactly when he did."

Dykstra put an arm around her shoulder. "I understand," he said. "Christians are fond of saying that no matter what happens, somehow it's in God's plan. We just don't expect it to seem obvious to us."

"Yes, Sunshine, Steve died exactly when he was supposed to. And right now, you, and the others, and I are all feeling that we're at a turning point. That the world we knew is soon going to be replaced with another. And more. We are all feeling that we are the ones playing the pivotal roles."

"I feel like I'm being dragged in," Sammi said. "Against my will. I don't want the fate of the world to rest with me."

"Nor I," Dykstra said. "But would you rather it rested with someone else? A long time ago a country called the Soviet Union fell apart practically overnight. When many of the leaders gathered together to see what they could make out of the pieces, an archbishop admonished them to be wise, because what they were about to do would be remembered before God and history."

"It is the same with us."

* * *

Though it had still been morning when the ship left the System Patrol High Command on Luna, the sun was near setting over Lake Michigan as the sleek military courier boat sliced through the high clouds on its way to a landing at West Michigan Spaceport. It killed its speed over a landing pad, then gently drifted down on repulsors.

Dykstra came out first, waving his characteristic cane in front of him. He stood up straight at the bottom of the step and took in his surroundings. He looked up at the sky which was pale blue and sporting archipelagoes of clouds. "My boyhood home. It's been a long time."

Rick stepped out of the boat, only backwards. He was trying to coax Hague along. "C'mon, Arie. Trust me. You don't need a helmet."

In the door of the boat appeared the short, pudgy figure of Dr. Hague. The little man looked out, tentative, unsure. He looked from side to side to side, took a sniff, waved his hand through the air as if convincing himself that it really wasn't vacuum. Then a broad smile broke across his face like a wave impacting the shore and he gleefully hopped down the two steps to the ground.

"Yes, yes, Earth, Earth. Yes, Earth! Blue skies! Oh yes. Trees." Something caught his eye and he followed it as it swooped slowly past, close to him then up and over the courier ship. It was one of the sea gulls so prevalent around the inland seas of Michigan. "A bird! Oh, yes! A bird! How does it work?"

"It's *alive*, Arie," said Lieutenant Nachteggall, finally debarking himself. Hague seemed about to pursue his studies of Earth immediately, but Rick caught him by the arm and the three came over to join Dykstra.

"Smell the air, Chris," Rick said. "Brings back memories, eh? I used to camp out on the beach not five miles from here."

"P.J. Hofmaster State Park?" Dykstra asked.

"Of course!" Rick said, laughing.

"You guys can compare notes on the way to the black docks," Nachteggall said. "I think that's our transportation coming."

The ground car drove up and they set out for the Capitol Products building, under which was the subway system that would take them to the shipyard.

There was a sense of rightness about it all, Dykstra thought. He looked at his fellow travelers. These were the right players; they were on the right stage.

He watched the sun set like the curtain at the end of act one.

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Pops had flown better spaceships than this one. He had just turned 73, and for more than 50 of those years he had been a pilot for the System Patrol. He'd begun flying during the Belt War of Independence, first in the small Mosquito-class fighters, then up to Balrog-class bombers.

Most recently during the current war with the Belt, he'd been jockeying top-of-the-line Capitol Products streakbombers. The ship he was now in was also of Capitol Products manufacture, but it had come out of the civilian shipyards, for the *Patricia* was a freighter. Two short, thick cylinders tied together with struts and open framework, a cockpit in the front and a fusion motor in the back: she was a sturdy, solid performer.

Paula Eriksen came up front from her sleeping cubicle. "Where are we, Pops?" she said around a yawn.

Pops confirmed their position from the console. "We're just over a billion clicks out from Fort Conger Station, which means we should hear from them anytime now about beginning the tests. How was your beauty sleep?"

"If you weren't such a harmless old man, I'd hit you for a comment like that," Paula said. "But I slept just fine, thank you very much."

Pops laughed.

It was funny, Pops thought, how events so outside your own life have such immediate effects. For years people had speculated about how changed the world would be once alien intelligences were contacted, had proclaimed the massive paradigm shift to how humans thought of themselves that the discovery would engender.

But seldom did anyone focus on how the monumental discovery would affect individuals in anything but the most general way. For Pops never would have thought that the discovery of the aliens would lead to his being in a freighter with a stunning civilian propulsion tech nine astronomical units outside of the Hague Limit.

A light started blinking on the control board. "That's our message incoming," Pops said. The message was not visual or audio. It had come over tight laser beam, encrypted, and when the communication computer displayed the decoded message, it said exactly what Pops had been told it would: Position confirmed. Commence test at 1400.

"Kind of a blah message considering what it is we're about to test," Paula said.

"Blah it may be, but the test starts in thirty minutes. I'd better get into my power suit and down into the cargo bay," Pops replied.

Pops went into the back section and the closet-sized cubicle that was his room. He stripped, revealing a tough, wiry body that called into question his chronological age. Quickly he climbed into his power suit, checked all the monitors, kicked in the full juice to the power servos, and set out for the cargo bay. For this mission, his suit weaponry had been removed. He felt naked without it.

The airlock cycled and Pops walked into the cavern, lit only by a row of lights along each wall. The bay was under vacuum since it was easier to keep the cargo clean that way. No one wanted this experiment fussed up by any stray dust particles, not that such was likely. The cargo hold was empty except for two pallets that sat in the middle of the floor, held there gently by the one-tenth *g* field that was typical for this class of freighter. On the port side pallet was a collection of boxes and cylinders running tentacles of wire and optical fibers up to a dozen places on the hull. Those wires were attached to tracking and monitoring devices attached outside the ship for this unique mission.

The other pallet held the experiment itself. It looked something like a coffin with two cylinders, each attached by its own boom, projecting from the end. Pops knew that inside the "coffin" was a first-rate minifusion generator and no shortage of mysterious scientific gadgetry. And Dykstra's crowning achievement, too.

"Ten more minutes, Pops," Paula said over the comm. "I'm opening the bay doors. Go ahead and push our baby out."

The doors above him slowly slid apart revealing a nicely framed sea of stars with a ribbon of Milky Way splitting it diagonally. Pops recalled a time when an experiment of this magnitude would have demanded the construction of a million-credit device to move the experiment the ten meters from the floor of the cargo bay out through the door. Fortunately, he was living in a time when a man in a power suit was recognized for his worth.

Pops gently lifted the box off the pallet. It massed over 2,000 kilos, an appreciable weight even in a tenth of a gravity. Taking aim, Pops jumped, and the leg servos provided all the thrust necessary to take him and his burden through the doors. He had sailed a hundred meters out from the *Patricia* when he let go of the box and stopped himself with the suit jets. "I'm clear, Paula. How much time now?"

"Five minutes. You'd better get inside if you want to watch."

"Why inside? I think I'll just watch it from out here."

"Suit yourself," Paula replied. "Now shut up while I orient the thing." Pops saw little jets fire briefly on the corners of the box. Paula was lining up the experiment's momentum vector so that it was pointing radially away from the sun. Pops' jump from the ship had been pretty much in the right direction to

begin with, but Paula was laying it into just the right groove.

Pops took his eyes off the box even as it continued its lazy journey away and looked around him at the endless night. The notion of alien beings "out there" had long ago been discredited, though he knew that in the past there had been periods when their eventual discovery was thought to be a certainty. But the Universe didn't seem to care much about human notions, and so while the "we are alone" paradigm reigned in exobiological circles, aliens, hostile ones, showed up.

They were out there now, in the Oort cloud. Waiting.

When the *Patricia* had left Fort Conger Station—itsself already 59 A.U. from the sun—Pops had piloted the ship for several days to put another billion kilometers behind her. They were out there to test the first human FTL drive, and it wasn't known if the aliens would be able to find out what they were doing or not. For all anyone knew, turning on the drive might be like setting off a flare to some alien sensor array. It was possible that those aliens would come seeking the source of the test. Hopefully, they wouldn't find Fort Conger Station, not with her a billion clicks sunward, but they'd almost certainly find the *Patricia*.

Pops knew what would happen then. He was at Slingshot when their raid had hit there, had lost friends, and had seen a hero made. But there would be no heroics from his ship—the *Patricia* was unarmed. No, at the first sign of the aliens, Pops was under orders to issue a single command to the ship's computer, and it would set off the warhead hidden under the deck plates of the cargo bay.

Paula didn't know about that. Pops hoped she wouldn't have to find out.

"Thirty seconds, old man, to the sublight test," Paula said. "Can you even still see the box? It's already over three hundred meters away."

"Military power suits have image enhancers and magnification, Paula. I thought you knew that?"

"Well, excuse me," she said. Then: "On my mark. Five, four, three, two, one . . . There she goes!"

"Wow! A hundred gravities. And not a hint of exhaust." As Dykstra had foreseen, as his and Hague's tinkering had produced, the experimental drive twisted and contorted, thinned and thickened space-time in such a way that the coffin box fled the sun at 100 gees. After a few moments, Pops said, "It's out of sight, now. I'm coming aboard to watch the hyperflight test."

"Roger, Roger," Paula said. Pops winced—she'd used that joke about ten times too often already, and he'd probably heard it a million times in his career. As he headed back, Paula kept him informed. "Telemetry looks good. We're getting all the data, and everything seems to be within the expectation values. This friend of yours Dykstra really knows his stuff." Pops had gotten to know the legendary Dr. Dykstra briefly on the Moon, when he'd brought in the alien hyperdrive motor from Slingshot. Briefly, but not too briefly that the man hadn't felt free to ask him for a very important favor.

A favor that he would soon know whether or not he'd be honoring.

Pops reentered the ship through the cargo bay doors, and jetted to the airlock rather than waiting to hit the floor and walking. He was out of the lock, out of his power suit, and back in the cockpit in less than three minutes.

"You didn't waste any time," Paula said. "I didn't think an old man could move that fast."

"That's probably not the only time you didn't think," Pops retorted.

Paula chewed that over, muttered, "Touché," and returned her attention to the monitors. "One hundred seconds to hyperflight. Give me just a second and—" Her fingers danced across the control board. On the center viewscreen the image expanded immensely, and right in the center they could see the box.

"There. Got it. We rigged a feed in from the optical recorders on the instrument pallet right into the cockpit. Now we can watch."

In seconds, history would be made. Or not. Pops had personally witnessed several now famous historical moments in his long career, but he'd never been able to wait for one with a countdown.

The optical trackers kept the image centered and continuously adjusted magnification to keep the box a constant size. One second before zero the space behind the box began to shimmer, a milky ring of mirage stuff formed, and then with a blinding blue-white streak the box whipped away at 200 million gravities.

"Holy smoke!" Paula exclaimed.

"So far, so good," Pops said, but he was every bit as impressed. "Quick—how long has it been?"

"That's ten seconds right . . . now. It should be back in normal space and transmitting."

It had been planned for the probe to remain in hyperspace for ten seconds, then drop out and activate a homing beacon. The instruments on the *Patricia* were looking for that signal now. Dykstra had calculated the velocity the box should have attained in hyperspace. As soon as the signal arrived, they'd have experimental confirmation.

While Paula remained intent on the monitors, Pops turned his attention to the ship's own scanners. He had no idea if the aliens would show up, but he was ready just in case. The destruct code phrase echoed through his head. He prayed he wouldn't have to use it.

Just a tad over four minutes from when the box went hyper, the beacon signal was acquired. "That's bang on," Paula said. "The box was moving at twenty-four times the speed of light!" Other data poured in during the next hour as the box continued to test the Dykstra-Hague hyperdrive—data on energy use, stresses in the engine, Dykstra field instabilities. The box returned to the ship finally, and Pops went out again to bring it inside and return it to the pallet.

There was no sign of the aliens.

This time, Pops thought.

* * *

Sammi had spent the previous evening at her apartment in Luna City. It had been the first time she was home since going to work for the System Patrol, and she'd had to look up some of her old friends. Though she'd loved being able to turn down the gravity in her apartment, and finally sleep in low *g* again, she had not intended to stay there last night. But she had gotten in late from her friend Martha's and had not felt like taking the military shuttle back to the High Command so late.

Once the shuttle arrived at the base, Sammi didn't bother going to her room since she was as ready as ever for work. She headed straight for her lab.

She walked in and was greeted with, "Well, you're back, Sunshine. I couldn't find you yesterday. I was afraid I was going to miss you this trip."

"Oh, Bob. Hi. If I'd known you were going to come by I wouldn't have taken the day off."

"What did you do?"

"I went back to Luna City for the day. It's been a while. My friends had begun to think the Patrol had spirited me away."

"I see."

"Any news?" Sammi asked.

"More attacks out beyond the Hague Limit. It's gotten the brass stirred up. There's a big argument going on about whether or not to tell the Belt about what Dykstra's accomplished. One side wants to keep quiet so the Solar Union can hoard the alien technology for itself. The other side, Knoedler's group, doesn't think this is any time for humanity to be fighting itself, and wants the Belt to gear up with us and get ready to take on the Phinons if they invade."

"Hmph," Sammi said. "They're arguing in the dark. We don't know enough to know what we should do."

"Yeah. But that's fairly typical in war, Sammi." Since they both knew they would be talking about Dykstra and the plot, Sammi suggested they go to her apartment where they wouldn't be overheard. There, she got Bob coffee and settled down herself with a cup of tea. "You haven't told me how the others are doing," Sammi said. "How is Chris?"

Bob finished swallowing his coffee and set down his cup. "He's like a man possessed," Bob said. "But he's happy. You should see the old guy. He only takes his cane along when we go for walks aboveground. He grew up in the area and he's particularly fond of the lake. When he's working he's down on the floor and greasy up to his elbows just like all the younger techs. Every time I walk into the dry dock I find the trinity of Chris, Arie and Rick clustered around something and talking in that technical lingo of theirs."

"Last time you visited you weren't so cheery about things," Sammi observed. Chris, Bob, and the others had been gone almost two months now, and this was only Bob's second visit.

"Last time I was in a funk because I'd spent too much time inside. It's stupid, just a psychological thing. But I had trouble getting used to the idea that just over my head was a lake, and if the roof gave way, there would be water forcing its way in. I'd much rather live with vacuum outside."

"But you're used to it now?"

"Yeah. And besides, I haven't been stuck there as much lately. I've made a trip to Mars since last time, and taken a couple spins around Earth-Luna." The lieutenant asked if he could get some more coffee, was already standing to get it, but Sammi told him to sit down and went to take care of it herself.

As she drew the coffee, she looked Bob over. He was a good-looking man, no doubt about that. He was also the first man she'd had in her apartment other than Dykstra since she'd come here. She searched her feelings and thoughts to see if there were any incipient desires inside her. Both with relief and reluctance, she told herself there weren't.

"I gather the work has been going well," she said, handing Bob his coffee.

"So the guys tell me. The first tests out beyond the Hague Limit worked to perfection, right down to the last decimal place. Chris was delighted and Hague went off in an ecstasy of `yeses.' "

"What about Rick Vander Kam?" Sammi thought she saw a trace of a frown cross Bob's face, but then it disappeared. "He was happy, too, of course. But working with Hague and Dykstra is a mixed blessing for him. He always was one of the best and brightest, otherwise he wouldn't have been working on the Phinon Project in the first place. But now he's teamed with the two best minds in the whole Solar System, and he's pretty much reminded every day of what he can't do."

"That's too bad," Sammi said. "He always seems like such a nice guy." There was that frown again. Sammi was starting to figure it out.

Bob changed the subject. "The one who has really taken to Earth is Dr. Hague. He just loves it there. I swear he takes the same delight in building sandcastles at the beach as he does in working on the hyperdrive. That, and feeding the squirrels. He's really got a fixation on his squirrels."

"What's going to become of him after this is all done?"

"How's that?"

"Hague. Where will he go after this war business is settled and the Phinon Project is no more?"

"I don't know," Bob said. "I never thought about it."

"I sometimes wonder about what's going to happen to all of us," Sammi said. She was thinking about what would fill the hollowness inside that Steve's death had left once the temporary and partial filling of working on the Project was over. But she wasn't going to discuss it with Bob, so she said, "Getting excited about the trip, Bob?"

The lieutenant looked wistful. "Oh, yes," he said. "I want to get to it." Then he went on. "But that's enough about me and the others. How about your own work, Sammi?"

"I'm making progress," she said. "Tell Chris it's slow but sure. They've hired another genano engineer, but he's not a Ph.D. yet. Oh, and you can also tell him I have the ampules of Promenidepromaine already prepared in what should be the right dosage."

"The what?"

"Promenidepromaine. PMDP. Just call them knockout drops for Phinons." She went to her workstation and returned with several clear containers of small spheres, each sphere having a hair-thin stinger sticking out. "These things. They're like ordinary injection ampules, except that I had these fabricated with honeycombed buckytube needles. They should be strong enough to penetrate the Phinon skin, assuming you can get close enough to use one."

Bob picked out a sphere and looked it over. "It's an iffy mission," he said. "We'll be lucky if we come back at all. But I don't want to dwell on that question now; I have another one. I was wondering what percentage of the aliens your genanites are going to kill. I mean, just how lethal are those things?"

"They'll kill every one they contact," Sammi said. "Why?"

"I didn't quite mean that. Every deadly virus I've ever heard of never kills everybody. Even some of the nasty things let loose in the wars of the Collapse didn't kill everybody. There are always survivors. I wondered what percentage of the Phinon species you expect your bugs to kill?"

Samantha looked very grim for a minute, then began slowly. "True, no known viral strain kills every host. It's actually a bit of a mystery as to why one never developed. Granted, if one did kill every possible host, it wouldn't survive long as a viral species itself. But there's no way the virus could know that." She looked Bob in the eye. "My genanites will not suffer from that deficiency, Lieutenant. It will kill every damn one of them."

"How?"

"Because I *want* them to!" she hissed viciously, revealingly, in reply.

That cooled the climate in the room considerably. Sammi knew it—she could feel the coldness inside of her. Bob was beginning to look uncomfortable.

He put down his coffee cup and rose to go. "I guess I'd better be heading out," he said. "Besides, if I hang around too long, I'll have to put up with an interrogation from Vander Kam about you." He smiled.

"About me? Why?"

"He's got a crush on you. You can see the jealousy in his eyes every time he knows I'm leaving for Luna."

Sammi knew Bob was waiting for some kind of reaction from her, no doubt looking for either a sign of interest or one of displeasure. *And hoping for the latter, eh, Lieutenant?* she thought. It wasn't quite fair of her—Bob had been a perfect gentleman. Still, she wasn't interested in humoring him. "I see," was all she said, and Lieutenant Nachttegall headed back to Earth no wiser.

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IV

During the course of his long life, Dykstra had many times been in the spotlight before audiences of VIPs: the movers and shakers, presidents, kings, and dictators, generals, admirals, members of the joint chiefs of staff. And so it was again this time, except now he was on the Moon in the restricted lecture hall of the System Patrol High Command.

And the stakes had never been this high.

He'd already discussed the events that had led up to his discovering the secret of the Phinon hyperdrive, and he had just ordered the projectionist to display the image of the System Patrol's first hyperdriven spacecraft.

"Gentlemen, I give you the *Hyperlight*. You System Patrol people will recognize the main structure as that of a standard streakbomber. We've left the core of the ship almost unmodified except for an extra mass conversion unit to power the shields and some power conduit additions from the hyperdrive engine power supply into the bomber's standard power array. Oh, and of course, it was necessary to modify the compensation fields as well." The last was a tremendous understatement. Standard compensation fields in a streakbomber could handle no more than 45 gravities of acceleration in a straight line. The *Hyperlight* was capable of eight times that.

Dykstra wondered if anyone would ask about that 200 million gee apparent acceleration that the ship would have when it went into hyperdrive. He'd explained it before that the acceleration and the streak of light were relics of the time interval it took the ship to transition from normal space to hyperspace. Since the craft would be going from essentially zero to twenty-four times lightspeed in a fraction of a second, to the ordinary Universe this looked like the craft was accelerating. Real fast. It was the recognition of the magnitude of the transition interval that had provided the final piece of the puzzle for Dykstra to solve the mystery of the Phinon hyperdrive.

"The most striking feature you will likely note is the addition of the two drive nacelles running from just before the center to beyond the stern underneath the main body of the ship," Dykstra continued.

"Why two engines, Doctor? The Phinon ships don't have two." The question came from an admiral several rows back. At least this was a question he hadn't answered for this group before.

"Think of them as two engine *elements*. By using these two elements working in resonance, the *Hyperlight* will be able to vastly outperform anything of the Phinons' that we've seen so far. Not only does the use of two elements greatly lower the energy requirements for transitioning to hyperspace, but they provide a reactionless space drive that will work *within* the Hague volume. As far as we can tell, the Phinons don't have that. We don't know why. But the engine brought in from Slingshot was only suitable

to provide reactionless propulsion outside the Hague Limit, and then only with significantly less efficiency than the *Hyperlight* has." While Dykstra was answering the question, the view had changed to one of the *Hyperlight* going through her paces in near Earth space. They watched as the ship performed an impressive series of maneuvers, then gasped when they saw the wild acrobatics to which Lieutenant Nachteggall had next subjected the craft—twists, turns, and right angle vector changes impossible for anything that had to throw mass to move. Dykstra tried to hide the pride he felt swelling inside.

"So what you're saying is that our first attempt, or should I say, *your* first attempt at developing a faster-than-light drive, is superior to what the aliens have despite the fact that they've obviously been an interstellar species for a long time?" The question came after the oohs and aahs had died down, from the slender but tough-looking form of Colonel Knoedler.

His question was expected. The script was familiar. Knoedler and he had continued to butt heads over the ideal use of the *Hyperlight* during teleconferences with the strategy group while Dykstra was on Earth. Sometime in the past months Dykstra had become convinced that Knoedler had other reasons for pushing his position so strenuously in addition to his stated fear of the Phinons finding out too much or of their running a ruse. In any case, the colonel was up to his same rhetorical tricks, this time trying to win support for his position among this collection of brass.

Dykstra met the question head on. "That is exactly what I am saying, Colonel." He noticed that Bob had entered at the back of the room.

"Doesn't that strike you as odd, Doctor? Wouldn't you expect that our first attempt should seem primitive compared to theirs?" Knoedler continued.

Dykstra decided to seize the initiative. In some ways, he liked the colonel, since the man was one of the few actually willing to question the judgment of the "smartest man in the world." But the stakes were just too high now, what with the *Hyperlight* preparing to leave soon. He needed every ounce of veneration he could get.

"Perhaps, Colonel. But that is an entirely anthropocentric view. Having never encountered aliens before, it is presumptuous to assume we'd have any understanding whatsoever of how they behave, or of what passes for a design and development philosophy among them. All I can tell you for sure is that the *Hyperlight* will *vastly* outperform anything of theirs that we've seen so far."

"I think that's a bit presumptuous, Doctor."

"How can *you* tell, Colonel? How many hyperdrives have you invented lately? How much grime from alien machinery have you had to wash off *your* hands?" Laughter rippled through the chamber. Dykstra knew how terribly unfair he'd just been. He also knew how satisfying it felt.

The Phinon problem was one of reconciling the mystery of their technology with a rational plan of

attack. During his investigations of the alien artifacts, Dykstra had noticed curious omissions in the designs of their implements. One in particular, the hand weapon, had really set him off into wondering just what kinds of beings these were.

To hear Knoedler tell it, these omissions marked a clear devious intent. Convinced that the Union's acquisition of FTL capability had come without sufficient blood, sweat, and tears, he'd been arguing that it was part of an alien plot to make humanity dependent upon a technology new to it (but probably obsolete to them) for which they knew the Achilles' heel. For him, that the Phinon hyperengines used only one element was clear evidence that they were feeding the Union the minimum amount of technological know-how to achieve their purposes.

Dykstra thought asking a Phinon why his hyperdrive didn't use two elements was like asking a human why his hand didn't have two thumbs.

The meeting broke up and after taking some additional questions from assorted generals, Dykstra set out to join Bob in the back. On the way, Colonel Knoedler passed him, but he was smiling when he shook his finger at him and said, "That was playing dirty, Doctor. But that round went to you." He then went on his way, whistling. At least with Colonel "Tommy," this was nothing personal.

"What did the colonel say to you?" Bob asked as they set off for Dykstra's quarters.

"He conceded that I'd bested him today at the meeting."

"You made him look like a fool, Chris. I saw."

"I'll do penance after the Phinons are taken care of. Have you finished settling your affairs on Luna?" There was no point in being roundabout. They both knew Bob might never come back.

"Sure thing. I even said good-bye to Sammi. Was that ever chilly. She just punched me on the shoulder and said, 'Good luck.' "

"Hmm," Dykstra said. "Perhaps we shouldn't find that too surprising. Are you leaving soon?"

"I'm saying good-bye to you, then I'm out of here."

They had reached Dykstra's door, and the lieutenant declined to come in. "Will a handshake and a 'Godspeed' do?"

"I guess it will have to," Bob said, and took Dykstra's hand firmly, but being careful not to crush old fingers, Dykstra noted.

"Godspeed, Bob."

* * *

Rick hadn't been in the corporate headquarters building of Capitol Products in five years, though when he walked through the front doors not a one of the security people questioned him, even guys that had been hired recently, and every secretary or executive who passed him in the hall greeted him with a cheery "Good day," and then either a "Mister" or a "Doctor" Vander Kam. So it was for the owner's son, even though said owner was still angry with him for not following in the family footsteps.

Rick could hear the conversation in his head without even trying, note the emphasis his father would put on each word in the fixed speech: "Your great-*grandfather* started this company, and your *grandfather* built this company with his *own* hands, and his *own* sweat, and his *own* genius, and your *father* is struggling to *keep* it growing, and the least you can do, *son*, is to help him do it."

But that's not me, Dad, Rick thought as he stepped off the elevator on the eightieth floor, which opened up directly across from the door to the executive suite.

This was the only place Rick felt he had to visit before he left with Bob on what they'd been calling "the great adventure." He'd taken a ground car to the building since it was in Grand Rapids, only fifty kilometers away from the entrance to the black dock facilities, and he wanted to see the West Michigan countryside of his youth—*one more time*? That was the question that went unspoken but acknowledged by them all.

But he hadn't come to just say good-bye to his father, or to make up, or to suggest some kind of restitution. Despite the lectures, his father was man enough to know that his son couldn't be pushed around, since he himself had raised Rick that way.

Rick had a favor to ask.

The door to the suite opened as he approached, and his father's secretary Anne smiled at him and said, "He's waiting for you," then she studiously turned away to whatever work she had been doing. Although Rick was not exactly estranged from his father, loud, verbal battles had not been uncommon in the past, nor had stormy exits from the building by Rick been either. The entire building—indeed, the entire vast empire that was Capitol Products—knew of the tension between Rick and his dad. But they also knew how much the father loved the son.

His father was sitting behind the surprisingly inornate (for a man of his station) oak desk that Rick's grandfather had bought the day that venerated Vander Kam had signed the contract that ultimately changed Capitol Products from a small factory making aluminum doors and windows into the vast conglomerate that now made the best of everything. His dad looked tired. And scared? He said, "Hello, son."

"Hello, Dad. How is Mom?"

"Good. And you?"

"Couldn't be better."

"I don't know how to say good-bye, Rick. I messed it up when you went to join the Patrol. The stakes are higher now. I don't want to blow it again," his dad blurted out.

Rick didn't know what to say. He'd expected to find the usual gruff, hyperconfident man that his father had always been. He did not expect to see his dad's heart on his sleeve.

"But Dad, we're only taking the *Hyperlight* for her first FTL tests. It's not that dangerous." And his father couldn't possibly know what they were really going to do. Of course, the man would know about the Phinons—the president of Capitol Products ranked higher than some heads of state in the Solar Union. But the real nature of the mission was known only to Dykstra's inner sanctum.

"Rick, do you know what the highest security clearance in the Solar System is right now? It's to have known James Christian Dykstra for going on sixty years. When I was a child the man used to read to me while I sat on his lap. Chris came to me right after he figured out the hyperdrive and told me what he had in mind. And do you know *why* he did that?"

"No," Rick said. None of this was like his father. Rick liked it. He wished he'd seen more of this when he was growing up.

"He came to ask my permission to let you go."

"He what? But I'm an adult, and . . . What did you tell him?"

"I said `Okay.' " There were tears in his father's eyes, and the man actually came from around his desk and embraced Rick. Rick was embarrassed, but also, somehow, humbled. Rick returned the hug.

Finally Rick disengaged himself and said, "I need to ask you a favor, Dad. You know Dr. Hague? I don't want him to stay with the Patrol after this is all done. I want Capitol Products to take care of him. I don't want there to be any chance that he'll be thrown away when he's no longer useful."

"You've grown fond of the little guy, haven't you?"

"Yes, Father, I have. And there's also a question of justice. But one more thing. Arie had an older sister. Her name was Sarobi. Somehow or other they were separated when he was only six. He stayed in the Belt and she was supposed to have been on her way to Earth. Do you think we might be able to find out

what happened to her?"

"I'll do my best, Son. But in return I want you to do something."

"What?"

"Come back."

After that, father and son said things without really saying anything, and Rick left the building and returned to the little beach house where he and the others had been staying when not working at the docks. Rick found Hague in the backyard feeding the squirrels.

"Yes, yes, Margaret, here's some for you. No, no, Fred, that piece is for Thompson. Yes, here is some cracker for you, Fred, oh yes." At the moment there were seven or eight squirrels crowding around Hague as he knelt on the ground. He had names for at least thirty squirrels now, and insisted that he could tell them all apart.

Arie Hague had taken to Earth with the same delight he had previously reserved for machines.

The phone buzzed and Rick left Hague with his squirrels to answer. It was Bob.

"I'm a half hour out, Rick. I just wanted to let someone know. And did you talk to your dad yet?"

"Yeah."

"*Yeah* . . . ? Well, what did he say about Arie?"

"You've grown fond of the little guy, haven't you?" Rick accused, echoing his father, then told Bob what his dad had said.

* * *

That evening they were sitting out on the back porch of the beach house, except for Hague, who was doing his seven P.M. feeding of the squirrels. "No, no, Matilda, that one is for Francis, yes, for Francis. Here's one for you. Good, Matilda. Good, good, good."

"The man has fallen in love with animals, I think," Bob said, gesturing to Hague down in the grass on all fours, handing out nuts to upwards of twenty squirrels, all scurrying around him, but sometimes going off in a game of tag.

"I hope it's not too hard for him to give them up for a while when he returns to the Moon," Rick said.

"Chris is coming down tomorrow morning to be with him on the trip back. Of course, we'll be gone by then."

"He'll do okay. Arie isn't the same guy I pulled out of that asteroid—hell, it was only a few months ago. Time sure flies when you're having a war. Anyway, he's grown a lot. You can tell. He might have turned out almost normal if it hadn't been so valuable to allow him to completely indulge his talents. But I think there's hope for him yet."

Another squirrel scampered out of the woods and up to Arie Hague. This one was noticeably yellower than the others, a blond in the midst of brunettes. "Welcome, Sarobi, welcome. Yes, yes, twice as much for you for all the times you fed me, yes, oh yes, oh yes."

"Sarobi?" Bob wondered. "`All the times you fed me'?" he repeated, puzzled.

"His sister," Rick said. "The first time he mentioned her I questioned him about her, but they were separated when he was six. Apparently something killed their parents and she took care of him for a while, then she set off for Earth. His story gets fuzzy after that. I got my dad to promise to try to find out what happened to her."

Bob got up from his chair and stood looking at the trees, listening to the soft breeze rustle the leaves. Having been born on the Moon, Earth was almost as novel for him as it was for Hague. Bob went down the two steps to the ground and kneeled down next to him, took some nuts out of the bag, and stuck his hand out toward the nearest squirrel, who promptly accepted the reward with no regard to the owner of the hand. Four more squirrels came over to the lieutenant, plainly expecting similar treatment.

"You little beggars," Bob said, but he got some more out. Then he stood up and turned to Rick still sitting on the porch. "I was just thinking of something. I remember Chris telling me how much he liked to watch the squirrels play at his house. Did you ever see his place?"

"Just pictures in his biography," Rick said.

"It was a beautiful home, up there on the side of that mountain. I picked Chris up from there when I took him up to the Moon to join the Phinon Project. I was just recalling what he said after he ordered the house to lock itself up. `That should hold her until I return,' " Nachtegall said in a fair impersonation of Dykstra's voice. "`That is, if I return. At my age you never know.' And I said I was sure he'd be returning." The lieutenant paused for a moment as if thinking real hard.

"Why did you think about that?" Rick asked finally.

"Up until now I've just taken it for granted that we'll be coming back from this mission. I just hope I'm righter about that than I was about Chris going back to his house."

There was silence around them, except for the chattering of squirrels and the distant wash of waves up on the shore, then Rick said softly: "So do I, Bob. So do I."

* * *

They left Hague sleeping as they got into the ground car at three in the morning. A guard would wait with the little scientist until Dykstra arrived. A driver took them to the entrance to the black docks, and after a short tube trip they arrived at the bay where the *Hyperlight* was awaiting her maiden voyage.

There was no fanfare at all, and the only recording of the departure of humanity's first FTL craft would come from the security monitors. Bob and Rick boarded the ship and the lieutenant sealed the doors from the pilot's bubble.

"Have any fancy words to say?" Bob asked.

"Not I," Rick said. "I'm too sleepy. But I'll have plenty of fancy words to say once we get back."

Bob cleared their departure with the lone technician and they felt the gentle bump as the pad the *Hyperlight* rested on was lifted up into the hangar dome, which was on the bottom of Lake Michigan, under 170 meters of water.

"Shields on," Bob said, then the dome split and water poured in. With the shields up, they formed a buoyant bubble which rapidly rose to the surface, and in a transition so smooth Rick didn't feel it, Bob hit the repulsors the instant they broke the surface and the *Hyperlight* climbed rapidly into the dark sky, breaking through the cloud deck in less than a minute, then climbing toward the stars on her atmosphere jets. Once at 30 kilometers' altitude, Bob cut in the converted streakbomber's original reaction drive and they thrust out of the atmosphere.

"What would happen if I used the reactionless drive in the atmosphere?" Bob asked. "I was just told not to, but not why. Did you guys ever try it during the tests?"

"Sure did," Rick said. "On a test bed aboard a barge out in the middle of the lake. It works, but it sounded like bagpipe music being played at three times the normal speed and 150 decibels. We haven't had time to figure out exactly why that is, but it seemed better just not to use the drive in the atmosphere."

Bob was both pilot and navigator, and Rick was of necessity the engineer. What their titles would mean once they were beyond the confines of the Solar System, however, was anybody's guess.

"Okay, we're almost at the blind spot," Bob said. He was referring to a position within Earth's shadow from where their switching to the reactionless drive was least likely to be noticed by probes and scanners from the Belt. "On my mark, five seconds to drive engagement. Mark. Five, four, three, two . . ."

"One" and "now" went unspoken as Bob flipped the switches, shutting off the regular engines and activating the new drive. The response was instant, and heartening in its smoothness, as Bob ramped the acceleration up past forty, fifty, even sixty gees.

"I don't feel a thing," Bob said. "Good compensation fields, guy."

"The best," Rick said. "They have to be or we couldn't begin to approach the maximum potential of this drive. Up around 92 gees or so we lose perfect compensation. The next ten-gee increase will result in us feeling about one-and-a-quarter gees of acceleration. After 120 gees every one gee increase will be felt as one gee, but you'd pass out before we got that high. And this ship would start to fall apart beyond 140 gravities." He was particularly proud of the compensation fields. He'd done his doctoral work on the theory of their construction, and it was the one thing he'd worked on in the outfitting of the *Hyperlight* that Dr. Hague had not improved upon. Much.

"Okay, we're heading south to Fort Conger Station and our flight plan calls for us to be there in four days. Let's make ourselves comfortable."

Despite the uniqueness of their craft, the journey out to Fort Conger Station was uneventful. They had to maintain communications silence so they had no messages to send, and there wasn't much of anything permeating the ether out so far south of the sun worth listening to. Rick and Bob spent a good deal of time continuing the chess match they'd begun in the beach house, and after 58 games, Rick was up by two. They also spent much of their time reading up on the Phinons. Chris had downloaded the entire Phinon file to the ship's library—which by itself could have gotten the old genius thrown in the brig—because he wasn't certain of which information the men would find useful.

One day out from the station, Rick came forward and interrupted Bob. "So, are you finally going to tell me who this third person is who's supposed to join us? Chris didn't tell me, so you have to know."

"I think you've already met him. He's that old commander, the black guy, who brought the Phinon FTL engine to the Moon from Slingshot. His name is Roger Tykes. Chris says he served with Sammi's husband out there. I don't know how Chris talked him into joining us, but he wanted as few to know about it as need be until we actually got off Earth."

"I *did* meet him briefly. Boy, secrets like this make me feel like a spy," Rick said.

"Think `traitor.' That's exactly what some in the Patrol are going to think if they catch on to what we're doing."

The *Hyperlight* crossed the Hague Limit with barely a ripple in space-time, though Rick claimed that his instruments showed exactly when the transition took place, and decelerated into a parking orbit around the wisp of an artificial world that was Fort Conger Station. After one revolution tractor beams pulled

them into the hangar and placed them in the special berth that had been built for the ship. So far, they hadn't deviated one iota from the official mission plan.

* * *

They debarked from the ship and were met by the station commander; he wore no insignia since the station was civilian owned. "Welcome," the man said. "I am Mr. Benton Booker. Dr. Vander Kam, I assured your father that we'd provide you two with the best rooms the station has to offer. Unfortunately, the best are barely better than the worst."

"Good thing it's only for one night, then," Rick said.

Just then Pops, who was wearing his insignia of a System Patrol commander, entered the hangar followed closely by a very attractive woman in a jumpsuit that did nothing to hide the outlines of the fine form inside. "Let me introduce you to Commander Roger Tykes and technician Paula Eriksen. They are the ones who've been doing most of the proxy field testing out here."

"Try *all* of the field testing, Booker," Paula said, not shy about setting the record straight.

"Okay, you can have Sammi," Bob whispered to Rick. "I'll take her instead."

"I don't know what the hell you're talking about," Rick shot back.

They both shut up when Booker had them all go through the usual hand-shaking. Much to Bob's annoyance, Paula barely gave him a glance and seemed somewhat fixated on Rick. "I've been eagerly waiting for you to get here, Dr. Vander Kam. I've wanted to discuss the ins and outs of the hyperdrive engine with you. Even though I've been intimately involved with constructing the test unit out here, I don't really know anything about the theory behind it."

"I'll do my best," Rick said, obviously bewildered, and delighted, by the attention.

"She's doing *her* best," Bob muttered under his breath. "Gold digger."

"What was that, Lieutenant?" Pops asked, suddenly standing right in front of Bob.

"Just clearing my throat, Commander. We're in for quite a treat for pilots, aren't we? But I have dibs on the pilot's seat when we first do hyperdrive."

"That's fine with me, Lieutenant Nachteggall. Just jockeying a ship driven by Dykstra-Hague impellers is about all my tired old heart can take," Pops said.

"Don't mind him and that tired old soldier bit, Bob. He'd cut your throat out from his death bed if you didn't salute him when you entered the room," Paula interjected.

"You say the nicest things," Pops said, rolling his eyes.

"What was that you called the new drive?" Bob asked.

"We all call it the `Dykstra-Hague impeller.' What have you been calling it?"

"`The new drive.' "

After a bit it was time to be shown to their quarters. Booker and the others took Bob and Rick in tow.

So these are the three who will make history, Bob thought on the way, surveying the group. Rick, the young but brilliant engineer; Pops, the wizened old soldier; and himself, the hotshot pilot out to prove his worth. Tomorrow they would do something that had never been done before.

He knew Dykstra would want him to bear in mind how history would judge them.

* * *

The same group had dinner together that night, then afterwards Pops took Bob into the labs because he had something interesting to show him. He'd wanted Rick to come along, too, but Paula had already spirited him away to discuss "the physical, er, physics."

"This is it," Pops said, as he pulled the tarp off a tangled, smashed cylinder of metal and peculiar electronics and stretched and kinked coils.

"So, you're an artist. Late twentieth century style, right?" Bob said as he looked over the mess before him.

Pops smiled at the joke. "That's right. I call this one, `Single Unit Hyperdrive Engine After Impacting Hague Limit While Activated.' "

"Holy shit," Bob said. "Looks like it's been turned inside out."

"Oh, it *was*. But through a hyperdimension," Pops said. "Just remember, Lieutenant. When we return we'll be the only two humans in the Solar System who know how to fly through hyperspace, so let's not try to come out too close to the Limit."

Bob looked over the wreckage again. "We're on the same screen on that," he said.

Meanwhile, in the small observation/lounge/bar on the top level of the station, Rick was discussing hyperphysics with Paula while trying not to notice the fine example of a non-Euclidean geometric surface on Paula's chest that she seemed not remotely shy about displaying. Instead, he tried to keep his eyes looking outward, through the dome and at the myriad of stars bejeweling the black satin, and at the splash of diamond dust that was the Milky Way.

"Anyway," he said, "once you activate the hyperdrive, there is a finite amount of time that it takes for the ship to make the transition from our space to hyperspace, and this appears as a two hundred million gee acceleration. The streak of light that we record is caused by photons actually created by the deforming of space-time. It's our biggest energy waster, but using two drive units reduces the losses tremendously."

He glanced Paula's way again, briefly, and saw that she still seemed to be listening in rapt attention. Rick was not unused to having women pretend to listen to him since it was no secret who his father was. The problem with Paula was that even if she was only with him now because of his family background, she might still be interested in the conversation because of her own.

"Of course, after the transition interval is over, the ship winds up in hyperspace moving along at almost exactly twenty-four times lightspeed, depending on your momentum vector."

"Why is that, Rick?" Paula asked through a dazzling smile. Or had he been drinking too much? Which drink was this one, anyway?

"Well, hyperspace is a continuum like normal space is. Our space has a velocity width of around three hundred million meters per second. Hyperspace one has a width of about fifteen million mps, except that `zero' is $24c$. If you turned on your reaction engines in hyperspace, you could actually increase your velocity, and you'd notice the change in kinetic energy once you transitioned back down. But when you're going a light-year in fifteen days, it just wouldn't be worth the fuel."

"I get it," Paula said. "But what did you mean by `hyperspace one'?"

"There are many levels of hyperspace it turns out. Once we have the technology to hit level two, we can move something like a light-year an hour. That's about warp eight in *Star Trek* talk. You familiar with the show?"

"I took a class on it in college," Paula said.

"At level three we're talking *Skylark of Space*."

This time when Rick looked at Paula he noticed that *look* in her eyes, and that she must have just moistened her lips. There had been music playing in the background in the lounge the whole time, but

now an instrumental version of "Waltzing on the Mountains of the Moon" began, one of the most infectious dance melodies of the last fifty years.

"I'd love it if you'd dance with me," Paula said.

The Hyperlight isn't the only thing capable of hyperdrive out here, Rick thought as he rose, took her hand, and led her out on the dance floor. They had just started when he noticed Bob and Pops enter. He nodded to them, noted Bob's leer in return and that Pops had rolled his eyes, then relaxed as Paula melted closer to him.

* * *

Bob and Pops took seats at a table near the back, well away from the bar, and ordered drinks. Bob decided on Irish coffee but was surprised when Pops ordered scotch—straight and neat. "You can drink that stuff at room temperature?" Bob asked.

"Can ye not also, laddie? I divvn't think I wish to gan oot amangst the stors wi' no nancies," Pops replied.

Bob dropped that topic and nodded toward Paula and Rick. "What about her, Pops? She hitting on him for his money or what?"

"It drives you right up the wall that she's with him and not you, doesn't it? Face it, Lieutenant—you're just a pilot in the Patrol. He's not only rich, he's brilliant. She could go after him for his money or his brains. Then again, maybe she just likes the cut of his jib."

"His *what*?"

"Never mind. Paula's a little mouthy, and maybe she would enjoy a little fling with the Capitol Products heir, but if he doesn't capture her heart, she'd drop it," Pops said, then polished off his drink in one swift motion.

Just then Mr. Booker came into the lounge. He had an urgent look in his eye. He looked around, nodded to Pops and Bob, then gestured to Rick still out on the dance floor. "Dr. Vander Kam, I need you to come with me right now." Bob saw Rick look at Paula, shrug, then watched, jealously, as Paula pulled Rick to her and kissed him before letting him come to join them. Booker was already at the table by the time Rick got there.

"What's all this about, Benton?" Pops asked.

"Your mission schedule is changed. You're leaving as soon as I can get you all on your ship. Now let's get out of here and I'll explain on the way to the hangar."

Bob rose then made a move to finish his drink. Booker stopped his hand and forced the glass back onto the table. Bob was surprised—Booker had not seemed like he had that much steel in his spine.

Pops said: "He used to be *General* Booker, Lieutenant."

The group hurried down the hall to the hangar bay. "Our trackers picked up a Dinosaur-class battleship on its way here and we weren't expecting one, particularly since no one except a few folks in System Patrol Intelligence are even supposed to know we're out here."

"What do they want?" Rick asked.

"We're pretending we don't hear their hails, but I assume they've figured out what you gentlemen are planning to do."

"*You* know, *too*?" Pops asked.

"I think the good Doctor Dykstra has called in most of the favors he's accumulated in his long life. I'll still owe him a few after this," Booker said.

They arrived in the bay and the *Hyperlight* was ready, bright, shiny, and beautiful. "Get going, men," Booker said. "Godspeed and all that. Bring us back some Phinons."

Pops' gear was sitting at the foot of the ramp, Booker having had it brought from the commander's quarters. His power suit had been stashed away earlier. Pops grabbed his gear on the way into the ship. The others followed.

Bob dropped into the pilot's seat and Pops took the seat beside him. "Strap in, boys," Bob said. "We're off in ten seconds."

The hangar doors opened and they lifted and zipped through the air dam. "Compensation fields balanced. Drive engaged," Bob said, and they shot off at 40 gees.

"There's the battleship on the Dykdar," Pops said, then: "What the hell? Looks like they're going to try to chase us. They're firing up the drive. It also looks like they're trying to raise us."

"Bet you a million credits Knoedler is behind this. Son-of-a-bitch got where he is by being suspicious. Well, we're supposed to be a hundred million clicks away from the station before we go into hyperdrive. Let's see how many we can rack up while we outrun that battleship," Bob said.

"Enjoying yourself, Lieutenant, *sir*?" Pops asked.

"You damn betcha."

Bob pushed the acceleration up to 90 gravities and the race was on. Of course, there was no way a battleship could do even half that.

"They're firing missiles at us. Those bastards!" Pops exclaimed, grinning.

"What's going on up there?" Rick called from the middeck.

"We're under attack," Bob said. "But I don't think it's going to amount to much."

In a straight line, the missiles fired at the *Hyperlight* could do upwards of 150 gravities. For a little while. They could not do near instant right angle turns. Bob let the missiles close to within a few dozen kilometers, then veered off sharply. The missiles lacked the fuel to even come close a second time.

But now the real test was before them.

They spent the next hours cruising out to a hundred million kilometers from the station and then there was nothing to be done except to become the first humans to go faster than light.

"On my mark, ten seconds. Mark," Bob said. Then: "Will we feel anything when we enter hyperspace? Sick? Disoriented? Anyone know?"

"We sent rats out on one of our tests," Pops said, again seated in the copilot's position.

"How'd they do?"

"They lived."

"That's comforting. Say good-bye to the Sun, guys," Bob said.

The hyperdrive engaged and the *Hyperlight* leapt toward the stars at an apparent acceleration of 200 million gees, leaving a long blue streak of immense beauty, unfortunately witnessed by no one.

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V

Sammi had been thinking about Bob a lot lately. Though Bob would have preferred that those thoughts concern him in a more personal (and sexual) way, it was actually something that he had asked her that had kept her subconscious going for a week now.

How many Phinons would her genanites kill?

She recalled the melodramatic way she'd told him that her bugs would kill all of them, but that was a reply more out of a thirst for vengeance than out of scientific reason.

In the era of genano technology, it was mandatory to insert within either the virus or the bacterium host a death gene that would cause the bugs to cease their activity after a specified number of replications. In some specialized cases where this was not feasible, the nanotools themselves might be designed so that they could shut the genano virus down when necessary.

This was to have been the case with her bugs during their original mission. They were to be released into the Martian soil, there to go merrily about releasing oxygen from the rust of the sea of sands that constituted so much of the planet's surface. After one hundred days of activity, the bugs would start manufacturing nanotools that wouldn't quite fit the bill for their task, and this would also lead to a failure to make food for the bacteria upon which the virus depended, and the process would grind to a halt. After the terraforming teams had evaluated the work done by the genanites, a new batch could be released to continue the work.

In the case of the anti-Phinon bug, however, since there was no way to know the size of the threat, and since there might not be any way to reinfect the Phinons (assuming they could infect them the first time!) it seemed clear to Sammi that she couldn't program in a death sequence.

She'd been sitting at her workstation for three hours straight, so she rose and went to get herself a cup of tea. Her hair was up in a severe bun, a style which she had never worn before Steve's death. She caught a glimpse of herself in the polished chrome canister that held eight gallons of hot tea for the entire laboratory section, and thought: *I even look like a bitch*. She reached up and pulled out the pins and let her long hair tumble freely down, then she tried to generate one of her famous smiles. She managed a weak grin. *But it's a start. The start of what, though?*

"Dr. Samantha?" It was Andy, the "other" genano engineer, though he was more of a regular biologist who'd taken a few graduate level classes in Samantha's specialty; a genano tech at best.

"Yes, Andy?"

"I'm having some trouble with those cultures you wanted me to make. Can you come look at them sometime this afternoon?"

Andy was clean-cut, shy, and he lacked confidence. It was easy for Samantha to walk over him. Sometimes she did. Though he was apparently an excellent biologist—the Patrol didn't put dummies at the High Command—he was far from being her scientific peer. Yet someone had to work with her to know exactly what she was doing in the sad event that . . . ugh.

Recalling that she was trying not to be a bitch, she said, "Okay. I'll fit you in."

She looked at the clock on her way back to her station, and realized that the *Hyperlight* was due to hit hyperspace in less than an hour. She had no way of knowing that the crew had departed ahead of schedule. And now she thought about Bob in a way that would have pleased him more.

Why did I have to be so cold to him before he left? Poor man. He knew he'd never get the sort of traditional send-off would-be heroes think they deserve. A hug would have been fine. And he deserved that. He's been a good friend ever since I got involved in this damn mess. And what did I do? He comes to say good-bye and I panic. I punched him on the shoulder, for God's sake! I never do that.

Now it was too late. He was out there with the others, and if all went well, he'd be returning with a Phinon or two, subjects that she needed, that they all needed, to find out if her genanites would work after all.

How will history view me? Samantha MacTavish—the fate of humanity rested upon her shoulders. But if it rests on any shoulders, it rests on a lot of them. Without Chris we'd have no hyperdrive, without me no Phinon killer bugs, but without Bob and the others we won't have those anyway. No—the fate of humanity rests with all of us.

Now, about killing Phinons.

She returned to her workstation and continued her research. Assuming she developed a working genanobug, how were they supposed to expose the Phinons? Chris had suggested that somehow they had to take on a fighting pair, either of ships or individuals, infecting one then killing the other so that the infected member would flee back to Phinon territory and hopefully infect the main group.

But unless they knew how the Phinons were distributed out there, this wasn't an easy thing to ensure. For instance, how long would the genanites have to lay dormant before activating? If they turned on too soon, the carrier might die before it even reached other aliens. And how dense was their population out there? This question too played into the equation of how to design the bugs.

Sammi continued to plow through file after file of unfamiliar material, all of it dealing with the distribution of matter in the Kuiper Belt and the Oort cloud. She hoped that by finding an average

separation, and by knowing the hypervelocity of 24c, she could somehow get a handle on how rapidly she could expect her bugs to spread given a single carrier.

Despite astronomy not being her field, she found much of it interesting, and some of it fascinating. She also discovered almost immediately upon accessing the files that many of the papers she needed had been authored or coauthored by Richard Michaels. The study of near extrasolar matter had been his particular niche.

It wasn't enough for her to just consult one textbook on the subject, for she knew too clearly from her own field that what was accepted as gospel in one text was sometimes considered outdated dogma in another, and she needed to know what everyone had to say. At least there seemed to be a consensus that the Oort cloud was not so much a cloud as a series of broad belts or bands. Good information to have—it meant right off that the average separation distance she had to consider would be much less.

But there was no consensus on the extent of the cometary halo, and thus, on the scale of the Phinon dispersion through space. It was clear that the Phinons had evolved on a planet somewhere—their physical structure was designed with a gravity well in mind. But what were they now? Were they strictly inhabitants of cometary haloes? And did it matter? Given the amount of transient material traversing interstellar space, cometary haloes as good as overlapped each other. With this the case, then the Phinons might occupy the space between the stars, and how many stars was anybody's guess. There wasn't any sound reason to suggest that they couldn't occupy the space between all of the stars in the galaxy. That would only depend upon how long they'd been around.

So just what was her virus going to do? Kill the Phinons around the Sun? Or kill Phinons spread across the entire galaxy, for century after century until all of them were dead?

She hadn't thought of it that way before.

Maybe it's time I did.

* * *

Massive, powerful, sublime—that was the effect that the architect of the Capitol Products corporate headquarters building had been commissioned to achieve. Patterned after the greatest of the old cathedrals and the shaft leading to the King's Chamber in the Great Pyramid, the architect had won a bonus with his design.

Even I feel intimidated, Knoedler thought as he entered the front doors. He had been forced to rent a ground car and drive himself from the spaceport since his aide had (apparently) messed up his transportation (again) and there had been no car and driver to meet him. This put him in a bad mood, and in some ways that was good, given the nature of his mission here.

Of course, the aide would have to go. How many was that in the last six months?

He did his best to ignore the psychological effects of the front entry and atrium, and reported to the main desk. Unlike Rick Vander Kam only the week before, the head of System Patrol Intelligence did not have a free pass even to the public restrooms. But Knoedler was sure that everyone working in the room knew who he was. He looked around and noted that ten security people were pacing the floor, when the standard complement was five. He also knew what sort of enhancements the security detail had been given to their bodies—most of them had been commandos in the Patrol Special Forces.

The receptionist took his name and waved to a security officer. Knoedler was led to a special elevator (and under a special arch for a weapons check), and then whisked up to the summit of the building and into the President's office, and seated a full five meters away from the massive oak desk of Wayne Vander Kam.

Vander Kam's chair was empty. Knoedler had to wait eighteen minutes and twenty-two seconds—he timed it—before Vander Kam emerged from a side entrance and sat down.

"Been a while, Colonel," Vander Kam said. "How's the new transport working out for you?"

The second ship equipped with the new drive was assigned to the head of System Patrol Intelligence. "It's everything the good Dr. Dykstra promised such ships would be," he answered. "Now, is your office safe from listening devices?" He knew it would irritate Vander Kam even to ask. This office was safer than most other such offices in the entire Solar Union. Capitol Products had greater financial assets than the entire planet of Mars.

"Of course, dammit! *You* know that."

"Good. The Patrol wants a favor. *I* want a favor."

"Voluntary or forced favor?"

"We can argue over definitions later."

"I see," Vander Kam said. "Colonel, I know how this works. Just what percentage of the Joint Staff even knows you're here?"

"I'll be honest. A small one. And it's my ass that gets hung out to dry if I screw this up. If I get caught, then I'm a renegade, a traitor," Knoedler said. Then: "Sort of like your son."

"*What?*"

"Thought that would get your attention. I know what Dykstra had planned. I know the *Hyperlight* isn't coming back on schedule. I know your son was in on it from the start." Knoedler decided to push the envelope. He held out his hand palm up. "I have his balls right here," he said, making a fist.

Vander Kam sat very still. Knoedler could see the rage growing behind his eyes. Powerful men usually kept themselves under very tight control. But they were always dangerous. Finally Vander Kam spoke. "And I have eighty floors between you and the pavement."

"Nice retort," Knoedler said. "I also have this," he said and removed an exceedingly flat but decidedly wicked looking energy pistol from within his shirt and leveled it at Vander Kam.

"How did you get that through security?" Vander Kam demanded. "Shoot me and you're dead before you reach the office door."

At least he looks scared, Knoedler thought.

The colonel said, "No doubt by the same security folk who missed this," while sliding the weapon back under his shirt. "Mr. Vander Kam, I am not looking for Pyrrhic victories. I need you to listen and I need you to know how serious this is."

"I'm listening."

"Good. How many ships will Capitol Products be able to convert over to the new drive in, say, the next month?"

"We're already getting the retrofit kits together for every version of military craft we manufacture. In a couple of weeks we'll be able to ship hundreds, maybe a thousand units a day," Vander Kam said. The man knew his company.

"That's what we projected in Intelligence also," Knoedler said. "But that isn't what's going to happen."

"Why the *hell* not?" Vander Kam exploded.

Knoedler told him. In detail. It took forty-five minutes.

"Bottom line, Mr. President, is this," Knoedler said near the end of the conversation. "I'm not asking you to do any more than your son is doing—risk being held up as a traitor if things don't work out."

Vander Kam leaned back in his chair. "I'll help you, Colonel," he said. "You and those shadows above you. I'll obfuscate the issue of why ships aren't being converted over much more quickly. But not because of your threats, dammit, to my son or to me. I'm doing it because I think you're right. Now get

the hell out of here. I don't like you and I don't like your methods. I never have."

Knoedler rose. "Shake on it?" he asked, but he didn't bother extending his hand.

"My word is good without it."

"At least let me give you this then," Knoedler said, reaching under his shirt and removing the weapon, in one motion tossing it onto the desk. It clattered and came to rest. Vander Kam picked it up gingerly.

"It's a fake," Knoedler said. "It's made out of a solid piece of the same stuff they make gel caps from. Your security sniffer thought I was carrying cold pills. I'm a sneaky son-of-a-bitch, Mr. Vander Kam. Never forget that."

* * *

"We're in hyperspace, men. Did anybody feel anything?" Bob asked. He was looking out into a sky gray with smears of darker or lighter color, and whorls and pulses. This was the tachyon sky Chris had told him he was likely to see, but he hadn't been prepared for the monochrome beauty of chaotic magnificence that the hyperspatial panorama turned out to be. Pops also seemed transfixed by the view.

Unfortunately, there was no way to navigate through it. For that, they'd have to drop out and look around.

"I didn't feel anything strange," Rick replied. "But I didn't know the engines would hum in that frequency range. Or maybe `drum' is a better word."

"Sounded like soft kettledrums to me," Pops said.

"Okay, we've got just a bit over a day until we reach the site of OEV 1, but we're going to have to drop out to take our bearings a couple times, and it probably wouldn't hurt to shed some velocity, too," Bob informed them. "We were going at a pretty good clip when we transitioned."

They settled in for the flight and after a while Rick exchanged seats in the cockpit with Pops so he could enjoy a good view of hyperspace for a time. Later, they gathered around the table to eat, and the first meal humans had in hyperspace consisted of hot dogs and french fries.

"Y'know, filet mignon wouldn't have been out of place for our first meal," Rick said with another handful of fries on the way to his mouth.

"I'll buy you the best steak in the Solar System once we get back," Pops said. "Now, will someone tell me why it is we're going to OEV 1? And while we're at it, will you tell me what OEV 1 *is*?"

"OEV 1 stands for Oort Exploration Vessel 1. It was a probe designed to head deep into the Oort cloud and figure out what the structure of the cometary halo actually is, in addition to picking up samples of pristine comet matter which conceivably hasn't been warmer than a few Kelvins since the day it was made. That's the ship Richard Michaels was on when the Phinons found him," Bob said, sounding like he was quoting from somewhere.

"Why was he on that probe?" Pops asked. "I mean, he was going to be gone for years. Why did they want a person out there anyway? Didn't the probe have the best expert systems available?"

"Computers don't go `aha,' " Rick answered. "It's been understood for a long time that, as expert or intelligent as you want to make a computer, they still don't match up to us in imagination. Some people doubt they ever will. So just in case something turned up out there that required an intellect capable of going `aha,' they sent him."

"You two sound like you know all about this," Pops said.

"We've both met Michaels," Bob told him. "He's not hesitant to tell you all about what happened. Getting him to shut up about it is something of a problem.

"Anyway, the reason we're going to OEV 1 is because Intelligence has had more time to think about the Phinons since Michaels was recovered, and also to reduce some of the data that OEV 1 gathered. That comet where he found the Phinon `refinery,' and where they attacked him, is right on the edge of a ring, or band, of comets. The Oort cloud isn't so much a cloud as it is a series of belts, and the distribution of matter isn't remotely homogenous. The hope is that from there we can begin to get a good idea of just how many Phinons are out here that we may have to deal with."

"I never heard the whole story of his encounter with them," Pops said. "Other than a few bits and pieces to give a general idea of what happened. Since you've both heard the account right from the horse's mouth, why don't you get me up to speed?"

Rick began. "The ship spotted something on one of the comets that shouldn't have been there, something that looked like a refinery. Obviously it couldn't have been anything people had put there. While he was wondering what it might be, a Phinon ship popped out of hyperspace and blasted the drive section of the ship. Then they landed on the ship and blasted their way in."

"That part I know about," Pops said. "And the airlock didn't even lock. They could have just cycled it."

"Almost. It was open on the outside. Once they entered, it closed and pressurized. Then they cut through the inner door, and once inside, could have just opened each of the doors down the corridor they were investigating. But they didn't even try. Michaels says he got the distinct impression that it never occurred to them to see if a door would just open first."

"When did he kill one with a spear?" Pops prompted.

Bob picked up the story. "Not a spear—a piece of wire conduit heated in the mess oven. He hid in the kitchen and when one entered he rammed it right through the breathing hole in the chest. After that it struggled and almost got him even though it was skewered, but he got its weapon and cooked its head right in its helmet. That killed it even though Phinons don't keep their brains up there."

"And then he threw up," Rick put in. "He always brings that up. Michaels is pretty much a pacifist. He wants everyone to know he didn't have a choice."

"He left the corpse in the hall to be found by the other," Bob continued, "and was hoping it would pause or something and then he could kill it. But the second one ran away the instant it saw the first one dead. He chased it but it got away to its ship and took off, never to be seen again."

"After that he lasered a message to the Patrol and within a few months the ultraspeed delivery ship the Patrol shot out of the cannon used the mass of the comet to slow down, then they gathered up Michaels and some artifacts and used the comet to fling them back into the Solar System."

"I still don't know what kind of ship that was," Rick said. "I never heard of this cannon thing before Michaels brought it up."

"The cannon is on Mercury," Bob said, "and the Patrol uses it to throw supplies and personnel out to the deep stations beyond Pluto's orbit. It costs a hell of a lot of money to use."

"It's scary, too," Pops put in. "I've ridden it a few times. Someone screws up on the field gradient by even a fraction of a percent, and you're either suddenly sausage or a pancake."

"You two have no idea about what kind of uproar his message created in the High Command when we intercepted it," Bob told them. "There Intelligence was, right in the middle of getting a war off the ground, and here comes this report of hostile aliens in the Oort cloud with advanced technology and maybe FTL technology. They wanted that alien `stuff' in the worst way, and they threw together that cannon shot in one hell of a hurry. And once that stuff came back, the Phi Nonsense group got a burst of funds and went from four guys to four hundred overnight—"

"`Phi Nonsense'?" Pops asked.

"That was the name of the subgroup dedicated to studying alien contact scenarios. No one ever thought the group would actually be needed. That's where the name for the Phinon Project came from."

The meal was almost over when Rick asked, "Are you hoping the Phinons show up at the comet while we're there, Bob? And you too, Pops? You're anxious to try fighting them ship-to-ship, aren't you?"

"I'm a wee bit anxious," Bob replied with a grin.

"You *bet* I'm hoping for it!" Pops answered, almost leering with delight. "I have a score to settle with those bastards. And besides, the Patrol needs to know how the *Hyperlight* would fare in an engagement. It's not every day you get to indulge in revenge for the good of the nation."

"How about you, Rick? You want to see what Arie's 'improved' weaponry can do, don't you? Aren't the laser cannons powered from their own mass converter now?"

It was Rick's turn for a guilty grin. "Guilty as charged. I'm a man. My brain's hard-wired for it."

* * *

The next day Bob directed everyone's attention to the screens. They'd dropped out of hyperdrive and were in the vicinity of the comet. "See that? If I'm not mistaken, that's OEV 1. We'll be in visual range in about fifteen minutes."

"Where's the comet?" Pops asked.

"The ship that picked up Michaels would have given the cometary mass a hell of a kick," Bob said. "It's probably—" He paused to check his scanner display. "The nearest large body is 42,000 kilometers away. That should be it."

This was their first time since leaving the Solar System that they'd had to try to match velocities with anything, and despite the ultra-high capabilities of the ship, this took time. But shortly Bob had the *Hyperlight* doing a slow pass alongside the huge bulk of OEV 1.

"I'm surprised she's not tumbling," Rick said.

"She has a power core separate from the main drive," Bob told them. "The Phinons didn't hit that. The attitude thrusters will probably maintain her orientation for decades." He was watching the screens intently. "In a couple seconds we'll be able to see where they blasted the ship."

OEV 1 had been fueled by antimatter and could have made it to the stars and back if anyone had wanted to spend decades aboard her. The drive tubes were 300 meters long, and the whole drive section was separated from the data gathering and life section by a boom another 200 meters in length. "Right there," Bob said, pointing. "See that slice right through the reaction chamber? Michaels says they did that from one hundred thousand kilometers away. The emergency systems dumped all the antimatter to space after the breach and the ship was dead in the water."

"That's *damn* good shooting," Rick said.

"Now we're going to do a pass on the life section," Bob said. "I saw Michaels just before we left, Rick. He told me about something I'd like to show you guys if I can find it."

Moments later, Bob pointed again. "Okay, freeze the screen. Right in the middle. I'm going to magnify it ten times."

"What *is* that?" Pops asked when the magnified image appeared.

"That's a Phinon's leg," Bob replied. "When Michaels was chasing the second one, once it got back to the airlock it had to blast through the outer door since it wasn't going to open with the inner one destroyed already. The decompression carried the Phinon out and it impaled its leg on that jagged piece of hull metal."

"Wait a minute. How did Michaels survive the decompression?" Pops asked.

"He said that the minute he saw them using beam weapons inside a spaceship he went and put his spacesuit on."

"A prudent move," Pops observed.

"He said he was just in time to watch the Phinon cut its leg off with its weapon and race off faster than hell back to its ship," Bob finished.

"Hold on, again. The Phinon still had its weapon while Michaels was chasing it, and it didn't shoot at him, and after it was impaled, it cut its leg off but still didn't shoot Michaels while he was watching it?" Pops asked.

"It's fight *or* flight," Bob said. "Not and/or. But that's enough sightseeing, here. The Patrol took everything of value from the ship when they picked up Michaels. Now let's see what's on that comet. They only popped down to look at the refinery and collect a few artifacts. There might be more to learn down there."

"Let's hope so," Rick said. "So far, we haven't found out anything new about the Phinons."

"Sure we have," Pops said. "We found out that we can fly through hyperspace for a day without having a flock of Phinons come after us. We'll be at the comet in a few minutes. I'm going to get my power suit on. Which of you two are coming with me down to the surface?"

"Bob, we're not landing on the comet, are we?" Rick asked. "If the Phinons show up we shouldn't—"

"Relax, Rick. We're not landing. Pops is going to jump down."

"I'll go down this time," Rick said. "But I don't have a power suit."

"You'll be safe as a baby in my arms," Pops told him.

* * *

"How long before Bob sets off the neutrino bomb?" Pops asked.

Rick checked the time in his heads up display. "Another five minutes," he said.

Rick had found the drop down to the surface of the comet as uneventful as Pops had promised, and was impressed by the old man's skill at maneuvering his power suit. Pops had canceled their slight velocity within twenty meters of the surface, then brought them down as smooth as could be hoped. Now, gripfields in their boots held them reasonably tightly to the ground in the trivial gravity.

They'd already looked over the "refinery" that Michaels had discovered. But after a brief inspection, they concluded there wasn't anything new that they could learn from it. Now they were waiting for Bob to detonate a neutrino bomb nearby. He'd placed the bomb out in space on one side of the comet, and was now positioning the *Hyperlight* on the other side, a hundred clicks away, to see what the blast would illuminate inside the comet.

Rick looked into the sky, noticing the bright star that was the Sun. He held up his thumb and covered it, and realized he'd also covered up the entire domain of human civilization. Then he turned to look at the rest of the stars in the sky, spread his arms wide and couldn't encompass it, and thought about destiny.

It suddenly came home to him just how much was at stake.

"What the hell are you doing?" Pops asked. He'd obviously been watching Rick's gestures.

"Just thinking about something," Rick said.

"Twenty seconds to detonation," Bob suddenly said over their comms. "Just to be safe I'd say you should look at the ground. You in particular, Rick. Pops' power suit can probably take the flash, but I don't know about yours."

"Okay," Pops acknowledged. They both looked at the ground, which suddenly brightened as if the comet had been moved to Earth orbit, then darkened again rapidly. Although the neutrino bomb expended 95 percent of its energy in neutrinos, that 5 percent given up as photons was not to be ignored.

Neutrino investigation of small masses was old technology, and within minutes the *Hyperlight's* computer flashed down a processed image of the interior of the comet which Rick and Pops watched on

the inside of the faceplates of their suits. "The expert system is going over the data now," Bob told them. "I told it to look for unusual cavities." Then: "Damn. Wait until you see this," and he flashed down an updated image.

The shadow image that was the interior of the comet looked like it had layers of spider webs superimposed on it. "Ever see anything like that, boys?"

"No."

"Nope."

"I've never read one of these before," Pops said. "But I gather each strand represents a tunnel or cave?"

"Bingo," Bob said.

"Artificial?" Rick asked.

"Has to be," Bob replied. "Guess we know what that means."

"Yeah," Pops said. "Where's the nearest spot to us where the network breaks the surface, Bob?"

There was a pause during which Rick discovered his palms were sweating. "You ever go caving, Rick?" he heard Pops ask, but didn't reply. He was still staring at the image of the comet.

He felt a tug on his arm and dissolved the image to look out directly into the face of Pops staring into his helmet. "You okay, kid? If it helps, I'm scared, too."

"About eighty-five meters northeast of the refinery it looks like a tunnel comes out," Bob reported.

"Let's go," Rick said, but his voice nearly cracked on "go."

"That's the spirit," Pops said. "But I'll go first."

"Damn right you will! You're wearing the power suit."

They'd defined a coordinate system before landing on the comet so they knew just which way to head, and soon they were standing next to a dark shaft about twelve meters across and no way to tell how deep. Lying right next to the shaft was a circular piece of something, also twelve meters in diameter. It looked like it had the remains of a hinge on the side nearest the hole.

"I guess that was the door to the airlock," Rick said.

Pops shined his light down into the shaft. "I can't see any interior door. This tunnel is open to vacuum. Maybe they all are."

"Abandoned? I hope so. But why would the Phinons abandon this comet?" Rick wondered.

"Why do they attack us?" Pops replied. "It's anyone's guess right now. Are you ready?"

Rick looked into the shaft, wishing there was some way to pierce the gloom below the limit of Pops' light. "Yes."

Pops picked Rick up and jumped directly into the center of the hole. They hovered there a moment while Pops oriented the suit, then he cut the jets and they dropped slowly into the unknown.

* * *

The elevator doors opened and Sammi was caught by the—there wasn't any other word to use than "romance"—of the image she saw. There was Chris Dykstra, supporting himself slightly with his cane, looking out at the vast array of stars, almost as if it were his domain.

Sammi had come to the observation bubble at Dykstra's request, though he hadn't said why he wanted to meet her here. She had seen him so little since the party, and had missed their talks, much more than she'd been admitting to herself, she now realized.

He still hadn't noticed her arrival. "Chris?"

He turned and smiled. "So good to see you again, Sunshine," he said.

"I tried to see you last week when you were supposed to come back, but I was told you were delayed a day," Sammi confessed as she joined him where he was standing.

"Yes. Dr. Hague refused to return to the Moon without taking along his squirrels, and no amount of discussion was going to change his mind. So we had to make plans to transport thirty-two squirrels up to Luna."

"How did you catch them?"

"Arie has been feeding them for months. He pretty much just *told* them to hop into his cage, and they did. What took time was setting up a place for them to stay when we got here. Arie has them in his lab, now, and he's constructed, er, is constructing continuously, quite a home for them. `Elaborate' hardly describes it.

"But tell me about you. How has your work been going?"

"Slow but steady," Sammi replied. "I'm pretty sure I can get the bugs to do everything we want, and I've been able to get them to manufacture their own tools now. But I've been wondering about the latency period. Do we want the Phinons to notice the infection quickly, or should it take weeks before the infection becomes apparent?" She did not mention her qualms about how many Phinons should ultimately die.

"Hmm. That's going to depend on how we intend to go about getting them infected, and how we want them to spread the disease to others," Dykstra said.

"That's what I think, too. I guess I should work on both a fast and slow version," Sammi said.

"I think that would be wisest."

"But I don't think you asked me here to talk about my work, did you?"

"No," Dykstra said, and then a troubled look came over his features, and he turned away from her to stare out into space, almost as if he was looking for something, perhaps the men in the *Hyperlight*. Finally, he turned back to her and said, "Tomorrow they'll be officially overdue."

"We purposely kept you in the dark as to most of the details, Sammi. There was no point in involving you more than necessary during the construction of the ship. One of the compromises I finally worked out with Knoedler was to let the men spend two days out of contact while putting the *Hyperlight* through her paces. They can't radio out of hyperspace, and we haven't developed the hyperspatial equivalent yet, though it's certainly possible to do. At any rate, tomorrow morning the *Hyperlight* will not return to Fort Conger Station, and Colonel Knoedler will have cause to start asking questions. He's been suspicious of me all along, but he'll need the delay of the ship to give him leverage to start making my life difficult. I want you to be ready in case he asks you any questions."

"What do you want me to tell him?"

"Mostly the truth. You knew I wanted a more involved first trip, and I asked you if having a live Phinon would help you in your work. But all that was months ago and you don't know any of the details. But if you're pinned down, I want you to lie about your understanding of the gravity of the matter. You're just a civilian who got caught up in this and to you the whole business just looked like policy squabbling among the higher-ups."

Sammi understood the logic of this, but she felt a little offended. "Chris, I know you want me to save my ass, but really, that's kind of—"

"Stop!" he snapped. She hadn't seen those flames in his eyes directed her way before, and she was taken

aback. "This has nothing to do with saving your ass. When this is all over you'll testify as to the truth with everyone else. But we *need* you to be able to keep working unimpeded. Now that the *Hyperlight* is finished, others can build more. Men with better tactical minds than mine, like Knoedler himself, can plot defense strategies. But you're the only genano engineer we have. It would take months for others to get up to your speed, and then I doubt that they'll ever be as effective as you. This is *your* war in more ways than just because you happened to be born when you were"

Well, there is Andy, she thought, but it didn't seem like the right time to bring him up. And for that matter, Dykstra's assessment was right.

His voice trailed off and he took steps from her and turned away again. Then he continued softly. "Knoedler might not even question you anyway. He's different, very clever. He had a ship out at Fort Conger Station waiting for the *Hyperlight*, ready to stop it. He might have succeeded, too, except that they left early so he wasn't in position. He hasn't come to see me about that, yet. But he's no fool. He's too sly to be second-guessed. And he commands a lot more power than his rank would lead you to believe."

"Is that why you're brooding up here?" Sammi asked. "Are you afraid of Colonel Knoedler? Is that why you snapped at me?" Lots of different feelings were coursing through her over that.

"I'm sorry about that, Sammi. Uncharacteristic, wasn't it? I haven't snapped at a friend like that since Jenny passed away."

"Your biographer friend Jenny?"

"Yes. I guess it makes sense. You remind me of her so much. I've told you that before. But actually, I'm not afraid of Knoedler. I'm probably more just worried about our friends. What did I send them into?"

"I've got a load of guilt about that, too. At least with Bob. I was really cold to him before he left, Chris. I acted like he was just going off on something trivial. I could have at least given him a hug. A stranger could have done that given the risk he's taking."

"Why didn't you?" Dykstra asked softly.

"I think because I felt like I'd be betraying Steve. Like if I let myself show any affection to someone else, then I'm somehow letting him go, like I'm getting over him. I don't ever want to get over him, Chris. Never." She did her best to keep from crying, and the fact that she was successful was itself disconcerting, more evidence that she was "getting on with her life."

"I know what that's like," Dykstra said. "There was a time when telling you that you remind me of Jenny would have felt like I was betraying her memory, too. But I'm not. You begin to get a better sense of perspective as time goes by, Sammi. When I compare you to her, I'm both complimenting you and

celebrating her memory."

"I've always wondered. Did you love Jenny, Chris? Why didn't you ever marry her?"

"I certainly loved her, Sammi. But it was as a dear friend. She, on the other hand, very much wanted more at one time. But then my friend Jamie won her over and she married him instead. After he disappeared—we never did find out what happened to him—she decided that her place was beside me, as friends, and things stayed that way for the rest of her life. I sometimes wondered what would have happened, but then, I don't have any memories that I want to give up to find out."

"I'm still surprised you never married her."

"Do you recall that scene in my biography when she, Jamie, and I met the first Protestant saint, St. Paul McAndrew?"

"Of course. He shook your hand and said, 'Through you, God will give Man the stars.' "

"That is correct, Sammi. But what Jenny did not record, couldn't bring herself to even though years had gone by since Jamie had disappeared by the time she wrote the book, was what the Saint had said to Jamie."

"Which was?"

"Right after he told me what God would do through me, he turned to Jamie and said, 'Which is as nothing compared to your destiny.' " Dykstra turned back to the sky. "Till the day Jenny died, we wondered if he'd ever come back. Considering recent events, I can't help but wonder about the Saint's prophecy again."

Sammi moved up alongside the old scientist and put her arm around his waist. He put his arm around her shoulder, and they watched the stars together for a time.

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VI

The lights of the power suit were adequate to illuminate the sides of the shaft as Pops and Rick continued their descent. The hole remained twelve meters in diameter, more or less, as far down as they could see, and the walls were rough-hewn out of the cometary ices.

They had only gone down five meters when they encountered the first side tunnel. By the time they had gone down a hundred meters, they had seen dozens, going off in all directions, ranging in size from three meters across to less than one.

The two hovered in front of one cross-tunnel and Pops directed a spotlight inside.

"I think that's a door," Rick said. There was a hinge mechanism visible on the side.

"It's probably the outer door to an airlock," Pops said. "Since there isn't an interior door to go along with the one laying on the surface, that means that this tunnel had to be open to vacuum when the outer door was opened. So unless these critters are really off the wall, they must have airlocks in each of these cross-tunnels. We do that ourselves in asteroid installations, but it's for emergencies. We always have one big one at the top of the tunnel. I wonder why they don't?"

The two continued down. More than 150 meters below the surface they came to a cross-tunnel much wider than the shaft they'd come down in, and set down on a closed door much like the one on the surface.

"Well, we can go in deeper by opening this door, or we can see where this big corridor leads," Pops said.

"Open the door? How?" Rick asked. "It's probably locked and the mechanism isn't powered."

"No, but my suit is," Pops replied.

"Oh."

"But I don't see any reason for going deeper. We're ignorant of the damn comet so we might just as well try the easy route. So—this way or that way?" he asked, pointing to their two options.

"To the right," Rick said.

It was easier for Pops to use his suit jets and carry Rick than to walk in the trivial gravity with gripfields. They had just started off when they got a call from the ship.

"What are you guys doing?" Bob asked. "I gather you haven't seen any Phinons."

"Not yet," Rick said. "These tunnels give me the feeling that I'm in some kind of abandoned mine."

"Reminds me of looking through a microcamera while it threads through an ant colony," Pops added. "A dead ant colony, though. I don't think anyone's been living here in a good long time."

As they proceeded through the big tunnel, they noted that the sides were dotted with many doors, identical except for diameter. They were ready to pick one at random when the tunnel ended in a hemisphere, also dotted with doors, all of them closed except for one, standing open like an invitation.

Without comment, they went through.

Just inside was a second door, opened inward. "Told you they were airlocks," Pops said.

The door led into a large chamber, one side roughly a hemisphere, and the other flattened, but entirely covered with peculiar shallow depressions, clearly paired, each pair outlining an elongated figure eight.

"What do you make of that, Rick?" Pops asked.

"Beats me," Rick said. "But have you noticed that since we've entered the comet, other than the doors, we haven't seen anything like what you'd find in, say, an abandoned human asteroid colony?"

"Like what?"

"Like the Phinon equivalent of walnut paneling on the walls, or cheap carpeting, or broken furniture in the corner not worth salvaging. We might just as well be in that ant hill you mentioned."

"There are light fixtures on the ceiling," Pops said. "At least, that's what I assume those tubes are for." Rick looked in the direction Pops was pointing.

"Okay, an ant hill with electric light," Rick said.

At the end of the chamber was a single door. It was closed. Like with all the doors they'd seen, on one side was a triangular knob. Pops turned it clockwise and it wouldn't budge. A counterclockwise twist and slight tug and the door opened. Unlike the entry to the chamber, this door was not part of an airlock. They went through, on foot this time since the door was too narrow to fly through together, and Pops shone the searchlight around.

"Ah. Technology," he said.

"Judas Priest," Rick whispered softly.

As Pops moved the beam around, now and then a brilliant reflection of blue or green or diamond white would come back from the huge and baffling array of oddly twisted and contorted instrument panels. "Indicator lights," Rick surmised about the reflections.

To the two humans, it was all a confused mess.

"Lieutenant?" Pops said, calling the ship. There was no answer. "Lieutenant? Where are you, Bob?"

"Bob?" Rick called himself.

"Right here," came back, and Rick found that he'd been holding his breath. "Sorry. I was in back running a statistical package on the structure of the tunnels. I'm up in the bubble again," Bob said.

"Just wanted to make sure you're recording this on the ship, too," Pops said. "We've found something interesting."

"Flash me what you're seeing through your cameras."

"Okay," Pops said. "I'm panning around this room. Now, you're our expert on Phinon technology, Rick. What do you make of all this crap?"

"I'd guess it's some kind of control center. But God only knows what it's supposed to control. Zoom in on one of the panels." Pops complied, and Rick continued. "That's pretty typical. Indicator lights, always circular, dials and knobs, but nothing ever calibrated. Or at least not in any way that we could figure out. I guess whichever Phinons operate these panels are just supposed to *know* how much to turn the knobs given whatever situation. And none of the lights are red. We think the Phinons might see in a spectrum that extends farther into the UV than ours, but not as low into the red. But that's just speculation."

"But every single control uncalibrated?" Pops asked. "Ye gods, there're millions of them in here. Bob, I'm going to pan around this room and get it all recorded. Hey, there's a table over there with some, uh, things on it." Pops went to the table. "Any ideas on this stuff, Rick?"

"None of it looks familiar. Looks like plumber's cultch," Rick told him.

"`Cultch'?" Pops repeated, the question obvious.

"`Good junk,'" Rick translated.

"We'll take some of these pieces with us on our way back out," Pops said. "I'm done recording by the

way. There's another door at the end of this room, Bob. Closed, but maybe not locked."

The door came open with no trouble at all, and Pops and Rick found themselves in another long tunnel, openings without doors lining its length, oriented in all possible directions. The tunnel curved away at the limit of their searchlight. They went down the tunnel and stuck their heads into each room. All the rooms were small chambers, empty, roughly of sixty cubic meters' volume, though the actual linear dimensions differed for each.

"What do you make of this tunnel, Pops?" Rick asked.

"Storage areas? Phinon apartments? Beats the hell out of me. But we seem to be heading in a less and less interesting direction."

Pops turned his searchlight directly ahead again and now they'd come far enough to see the end. "Another door," he said. "Let's try that one, and if it turns out to be a loser, we'll try another direction."

"Okay."

Pops opened the door, they went through, and stood there in stunned silence, just looking around. Finally, Pops said, "Well, we wanted interesting. This fits the bill."

"I saw a picture like this once," Rick said. "It was of the dead they found in the Nazi death camps after the Second World War. Bodies stacked like cordwood. Of course, they weren't Phinon bodies."

Stacked all around them in nearly every possible place were bound bundles of dead Phinons. The bodies were entirely desiccated, but it was unclear to them whether or not they had gotten that way from their exposure to vacuum, or if they'd been dried out before being stacked and strapped together.

"So, you've found the Phinon graveyard." It was Bob. Pops and Rick had almost forgotten that he was watching through the video link. "I'd love to try to figure out what their views are of the afterlife from this display."

"You'd think you'd get a creepier feeling from looking at something like this," Rick said. "But, hell, Phinons use hydraulics. If you didn't know they'd been alive you'd think you were looking at bundles of used parts from an earth-moving-machine junkyard. It's all knobs on the ends of steel struts and pistons and tubes."

"That may be, but their physiology is fascinating. I've been studying that stuff Chris gave us from the bio group. The steel of their bones isn't particularly high grade, but it's still *steel*. Some of their tendons are actually like strands of steel cable, and others are just plain steel rods. But that hydraulic fluid they use is really interesting stuff. It's a little more viscous than pancake syrup usually, but it looks like the Phinons can release some kind of hormone into it and it suddenly turns rock solid. That would pretty much give

it an unbreakable grip."

"This is all very interesting," Pops said. "But what do you want us to do? I'm beginning to think we're not going to find much more on this comet than this."

"I agree with Pops," Rick said. "This comet is as riddled with tunnels as it could be. It's probably been mined out, so to speak. The refinery on the surface is probably just extracting what volatiles are left that are worth using."

"Okay," Bob said. "But we'll have to see some more comets to know if this one is remotely unique or not. Guys, cut a couple of those dead bodies loose and bring them back to the ship. Oh, and get the bodies from different stacks, preferably two stacks way far apart. It might make a difference. Then come on back up. I'll be station keeping right above the hole."

* * *

Rick stepped aside from the display and showed the results of the most recent neutrino scan to the others. "Same sort of thing," he said. "That makes an even dozen."

Pops inspected the screen and asked, "Any variation in the network of tunnels?"

"Yes, but very slight. At every comet we've visited, the web of tunnels always has exactly eight main tunnels that come out at the surface, and each tunnel supports a web work that intersects with the others at exactly one point deep in the interior, and that one connects to the hangar hole." The "hangar hole" was a sixty-five-meter-wide shaft they'd found at each comet bored deep into the core. Their best guess was that the Phinon ships landed inside since there wasn't any evidence of landing facilities on the surface of the bodies. "And all of these comets are abandoned except for those little refineries."

In the past three days the *Hyperlight* had visited twelve cometary bodies through this local cluster, crossing several light-hours in the process. They had yet to find any Phinons other than the stacks of dead ones.

"I say we try a different cluster," Bob said. "Maybe we'll have better luck there."

"I've been thinking," Pops said, "about why we haven't had any Phinons come to find us yet. Maybe they can't track ships in hyperspace at all. At least, not over any great distance."

"That doesn't make sense," Rick said. "Even though we can't do it, we do have a pretty good theory for how to build a hyper-radar. We just haven't had time to do one. So they must have— Oh, I see what you mean. It might be another one of those things they missed."

"Could be," Bob said. "But I'm not going to count on it. Any idea how they found Michaels the first time

in OEV 1?"

"Well, they had a year or so to watch a high energy jet heading out from Sol for the halo. They could have seen it coming with a decent telescope," Pops replied.

"We might as well get going," Bob said, heading forward to the pilot's bubble. He hated to admit this to himself, but he was actively bored. Rick could enjoy looking at negative results from investigating the comets, and even though he'd descended with Pops to some of the comets, all the suspense had been gone after the first drop. For most of this trip, Bob had been steering the ship and commanding two other men to do that which those same men had to tell him was the best thing to do.

He took his seat, checked the navigation data, then said, "Hyperdrive in one minute. ETA a little under two hours." He lined the *Hyperlight* up and watched the rainbow dazzle of the stars during the now routine transition.

An hour later the general quarters klaxon sounded.

"Holy shit!" Bob exclaimed, coming instantly out of a light doze in the pilot's seat.

Ordinary Dykdar works in hyperspace, as long as it's only looking for something else that's in hyperspace. Two of those somethings were suddenly to starboard of the *Hyperlight*, two million kilometers away but closing the distance rapidly.

Bob immediately dropped them to sublight.

"What the hell is going on?" Pops said as he joined Bob up front.

"Two ships, in hyperspace. They gotta be Phinons. I went sublight. Now I'm scanning with Dykdar to see if they're going to come out with me." If one ship drops out of hyperspace one second before another, when both are sublight they'll be at least 24 light-seconds apart. Thus, Bob and Pops waited for Dykdar echoes to return to the ship.

"I'll get the weapons ready," Pops said. "Shields are at full."

Bob called back to the middeck. "Hey, Rick! Strap in. I may have to push this bitch to the limit!" He didn't wait for an acknowledgment, and realized he was running at a million RPM right now.

He felt a hand on his shoulder. "Settle down, soldier," Pops said. "This is supposed to be fun. And I have some scores to settle."

Bob smiled at the comment. "There. We have a return."

"Yeah. And they're scanning us, too. Once they have us fixed they're going to go hyper and pop out right next to us, I bet. That's what I'd do." Dogfighting strategy with hyperdrive capability had been the prime topic of conversation among "in the know" military pilots ever since the Phinons showed up.

Sure enough, two blazing streaks appeared ahead of the *Hyperlight*, at the end of which were Phinon spaceships. Now sublight, they were coming in fast. Bob turned the *Hyperlight* to starboard and down at 90 gees.

"Those ships are identical to the ones that pounded Slingshot," Pops said.

"Yeah. The 'eight man' model. They've turned to follow us," Bob said. "And one of them is coming right smack up our ass. One hundred klicks and closing."

Pops looked at him. "You're kidding? Are they *that* stupid?"

Bob shrugged. "We'll know in a second." Bob turned on the reaction drive. If they hadn't already been using the Dykstra-Hague impellers, the ship would have shot off at 45 gravities. As it was, the relativistic particles from the drive slammed into the shields of the pursuing Phinon, turning the ship into a glowing pearl that died within seconds.

"Okay. As dogfighters, Phinons are assholes," Pops said.

"I guess it's been a little while since they last used reaction drives," Bob added. "And there goes the other one." The tail of the remaining Phinon ship began to glow and waver, the signature of the coming transition to hyperspace. "But this time it ain't getting away!" Bob said, and as the Phinon ship streaked away, the *Hyperlight* made a streak of her own.

After transition, Pops read the scanners. "Great timing! He's only thirty-two kiloklicks ahead of us."

"Okay. I've got him in line. Reaction engines up and blasting, Pops. We're closing. Their ship isn't going to be able to add delta v under hyperdrive," Bob said. "But we're going to have to shed ours before we try our next rendezvous with a comet."

"Either of you guys care to tell me what the hell is going on?" Rick called from the middeck. Pops told him. "What's to keep it from dropping out of hyperspace so you overshoot?" Rick wondered.

"Nothing," Bob replied. "But I don't think they'll do that. Doesn't seem to be in their natures."

"I think you're right," Rick said. "Remember Michaels' experience. Even though he pursued one that could have fired at him, it didn't bother. Fight *or* flight."

"And that girl at the Deepguard base, Nikki Le. She pursued a Phinon, too, and all it cared about was getting away," Pops put in.

The *Hyperlight* was closing rapidly. They were less than five thousand kilometers behind when the shields went milky. "Holy shit!" Bob exclaimed while the ship performed an automatic corkscrewing-to-port evasive maneuver. "God damn! What was that?"

The shields cleared but then clouded over again as a fusillade of explosions went off across the sky, like a bomb barrage in a fireworks display, though none of them was close enough to cause real harm. Then the scanners returned to showing a fleeing Phinon ship and the *Hyperlight* resumed the pursuit.

"Got it," Pops said, reading from the tactical display. "First he nailed us with an X-ray laser. Helluva powerful one, too! If he'd waited another few seconds until we were closer he might have fried us. After that it looks like he dropped his whole bomb load and set it off. He threw the kitchen sink at us, more or less. I guess its fight *and* flight when they're in a ship. At least if they're pursued."

"How many bombs?" Bob asked.

"Sixteen," Pops said.

"If the other wrecked ships Intelligence has examined are typical, then he doesn't have any bombs left," Rick said. "Do you have a figure for me on that X-ray blast?" Pops gave him a number. "I'd doubt he could let us have it with another shot like the first. That one should have consumed his laser."

"Good. We're within range, Pops. You have the most personal stake in this. KKV or laser or particle beam?" Bob asked.

"Particle beam," Pops said. "It's the closest thing we have to a sword."

"Kill him at your discretion, old man."

"Thank you, Commander." Pops reached over to hit the fire button of the particle cannon. Before his finger could touch it, the Phinon ship self-destructed.

Pops looked at the expanding cloud on the screen. "Shit. Vengeance denied," he said softly.

"Guess I'll kill some kinetic energy," Bob said, shrugging. Then: "Y'know, what we just did was worth violating orders all by itself. Now we know how inept Phinons are at ship-to-ship combat. Take away their hyperdrive and reactionless engines, and even with their better weapons, the Patrol could have taken them on without Dykstra's help."

Those words Bob would remember, and be embarrassed by, for the rest of his life.

* * *

"We still don't know if they found us by design or by accident," Rick said. They had dropped out of hyperspace half a million kilometers away from their next comet and were looking for Phinon activity. "Those ships might just have been heading in our direction."

Pops, who was the one doing the watching at the moment while the other two sat at the table, suddenly said, "We have a live one!" The others wasted no time in joining him in front of the screen.

"See? Right there. Two ships came out about nine kiloklicks away from the cometary body. They're almost to it now." Pops cranked up the magnification even higher and picked up the dark circle of the hangar hole. As they watched, the two Phinon ships flew inside.

Now it's going to get interesting, Bob thought.

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VII

Standing in Hague's lab was remarkably like being inside the summer crown of a five-hundred-year-old oak. With the sort of single-minded devotion of which the diminutive savant was the unique practitioner, Hague had set out to turn his laboratory into the perfect lunar home for his squirrel friends from Earth. He'd had wire mesh branches fashioned in the metal shop, had holders and tables and hangers fabricated upon which to put live oak saplings imported from Michigan. He himself had put in the plastic tubing to carry nourishment to the trees, as well as the equipment to keep the squirrels fed and happy during his inevitable absences.

Dykstra liked coming here. He liked the smell—of nothing but fresh nature—Hague's system for removing squirrel feces had already brought a visit from Admiral Towner, whose family owned a private zoo on Earth—he liked the artificial breeze, and he liked the constant chatter of the squirrels.

Dykstra leaned heavily on his cane. He'd just come from an uncomfortable interview with three of his superiors. They'd had a lot of questions to ask him about the *Hyperlight* and what ideas he might have as to why her return had been delayed. Though they hadn't directly come out and accused him, they'd left little doubt that they suspected him of duplicity, of engineering his own plan for the first mission of the FTL ship.

In short, the truth.

A squirrel with a patch of black on her right shoulder stopped to look him over. Dykstra took an acorn from his pocket and handed it over. "Here you go, Bixy," he said. Bixy was one of the few that he recognized. The squirrel took the offering and bounded off.

Dykstra had parried their questions. He reminded them of the unique character and unique dangers of the mission, confessed (falsely) to uncertainties he still felt about some of his physical assumptions concerning hyperdimensional structure, and admitted (honestly) that he had no idea why the men had yet to return even though they were almost a week overdue.

In short, he snowed them.

But he didn't like doing things this way. In fact, he hated it. But at least Knoedler hadn't been at the interview. The colonel would have been able to ask much more difficult questions. No doubt, though, that the colonel would still get his chance at him.

"Welcome, Dr. Dykstra. Oh yes, welcome, welcome," Hague said, interrupting Dykstra's thoughts. Hague had just come out of his adjoining quarters, carrying a bag of food for his friends.

"Thank you, Arie. Are you just about to feed the family?"

"Oh yes, Dr. Dykstra. Yes, yes. They get hungry, oh yes. And they need me." Hague proceeded to a "limb" nearly a meter wide, and the whole chattering congregation soon assembled.

One squirrel, by far the most yellow of the whole group, got the first bite. "Here you go, Sunshine. Oh, yes, yes. This is for you, Sunshine. Oh yes." Sammi's namesake scampered off to a nearby branch with her treasure and Hague went on to the others. The woman herself would be arriving any time now.

"Here you go, Sarobi, oh yes. You always gave me your food, oh yes you did. Yes."

Hague's sister. The mystery girl out of the little man's past. "When was the last time you saw your sister, Arie?" Dykstra asked.

Arie looked at the clock briefly, then answered, "Forty-two minutes, eight hours, seventy-two days, and thirty-nine years ago, yes."

"Why did she have to take care of you? Where were your parents?"

Suddenly Hague stopped moving. The squirrels chattered impatiently, waiting for the next handout, but Hague stood immobile, then suddenly spoke in a voice not his own.

"`We have to do it, June. We gotta put the kids in the lifeboat!' " It was a man's voice, oddly raspy, like he was very sick and weak.

"`We can't, Ted. I can't do it. How will they take care of themselves?' " This was a woman's voice issuing from Hague. Dykstra had no doubt that he was doing a perfect impression. The woman's voice sounded even sicker and hollower than the man's.

"`The boat will take them to Ceres by itself. We gotta, June. The radio ain't going to be fixed. We can't wait for help. We ain't gonna make it another day.' "

"`Mommy! Mommy! I don't want to go. I want to stay with you and Daddy! Don't make us go. Don't, please!' " This time it was a little girl's voice.

"`We don't have any choice, Sarobi. Your mom and me—we, we ain't ever going to get better. You and Arie have to go in the lifeboat. It will take you to Ceres. People will help you there. And you have to look after your brother. He's special, Sarobi. Jesus wants you to look after Arie. You tell folks you want to get him to Earth.' " The talk was interrupted by periodic bouts of coughing, Hague being faithful to his recollection.

"`Good-bye, Mommy. Good-bye, Daddy. I love you. I love you,'" said the little girl's voice, choking with tears and sobs.

The image Hague's recitation brought to Dykstra's mind came close to choking him up, and perhaps would have had Hague not then suddenly come out of his state and resumed feeding his squirrels as if nothing had happened at all. "Yes, Peter, this is for you, oh yes."

"May I feed them, too, Arie?" Dykstra asked.

"Oh, yes, Dr. Dykstra. Oh yes."

The door opened and Sammi took a step in, then stopped and looked around. Dykstra saw her sunshine smile emerge as she took in the room. This was her first exposure to Hague's newly furnished laboratory.

"Wow! This is really something. Oh, Arie, you've outdone yourself," Sammi said, coming toward them.

"Oh, thank you, Samantha, oh yes, oh yes, thank you, thank you!"

Samantha started feeding the squirrels, too, and Dykstra filled her in on the meeting he'd had with the superiors.

"So you're convinced they suspect you went ahead with your own plan against orders?" Sammi asked.

"I have no doubt. But I'm also sure they have yet to put together sufficient proof to come out and accuse me of it. After all, this mission was always recognized as being dangerous—that's why the conservative plan was originally adopted in the first place. I had to fight like the dickens just to get them to agree to two days instead of one for that very reason."

"Did they ask about me?"

"Not a peep, Sammi. You just keep quiet about things. If they do ask you any questions, deny everything like we said. I hate having to have to tell you to lie, but the stakes are way too high to go wobbly now," Dykstra said. "But your own work—has it been going well?"

"Now that's a piece of good news," Sammi said. "I've had some good luck. I can give the genanites any kind of latency period that I want. At least, in simulation. I won't know for sure unless—I mean, until the guys get back."

Dykstra noticed the slip. "I'm starting to get a little worried, too," he said.

"Want to come to my lab and look at what I've been doing, Chris?" Sammi asked.

"I would love to, but I cannot," Dykstra said. "I'm wanted on Farside. Paracelsus crater. I need to pack a few things. I'm leaving in two hours." He sighed. "Do you know that since my return to Luna, I haven't had the time to do a single worthwhile thing either in the lab or at my workstation? Just politicking and subterfuge and giving evasive answers to questions. And there's so much to do."

"I'm sorry to hear that," Sammi said. "So I'm almost afraid to say this, but be sure to come by after you get back."

"Certainly, Sammi. Seeing you is always a pleasure in its own right," Dykstra said, smiling gently.

He did not mention to Sammi that although he'd been asked to go to Farside, there wasn't anything like a rational reason for it that he could see.

* * *

It was while he was on the special shuttle waiting for the pilot who would take him to Farside that Dykstra got the notion that perhaps he'd find out about things even before the shuttle got to its destination. He knew he was right when Colonel Knoedler came aboard, sat down at the pilot's controls, and said, "I expect we'll have an interesting flight, Dr. Dykstra."

"No doubt," Dykstra said, taking the arrival of the colonel in stride. "May I ask if there is a genuine reason for going to Farside?"

"Why certainly there is, Doctor. But we'll be at the top of our ballistic when we'll be notified that our scheduled meeting has been canceled, and I'll abort to a single orbit return to base."

The two said no more while Knoedler took the shuttle out of the docks and sent them thrusting on their way. Within seconds of leaving the surface, Dykstra noticed that the colonel had activated the defense screens. "I gather you don't want to risk any chance of our conversation being overheard," Dykstra said.

The colonel turned to look at him. He had soft brown hair and tight, brown wrinkles around eyes that lased in the ultraviolet. Tendons in his neck stuck out like cables and his jaw muscles were prominent. "You have that right. But I wouldn't have had to bother if you'd just tell me how it is you've managed to make your quarters bugproof. I finally told my men to give up last week."

Dykstra smiled. He'd known men like Colonel "Tommy" before. This was a man of honor and honesty, even though he had been diametrically opposed to Dykstra's plans. "When this whole shebang is over, Colonel, I'll let you in on a few of my other secrets."

The message that the Farside meeting had been canceled came at the expected time, Knoedler tweaked the thrusters, and they entered the groove of an unpowered orbit that would take them around the Moon

and back to the High Command.

"Let me tell you about myself, Dr. Dykstra," Knoedler began. "As a boy, you were my idol. I had a high IQ and knew I wanted to study theoretical physics by the time I was seven. Given my personality, I wanted to both emulate you and overthrow your work. But it didn't take long for me to realize that you were in a class by yourself.

"Ultimately, I wound up in the service, and in my current position, and I like it here. I also have a confession to make. It was I, and not Major Moore, who tried to keep you out of the Phinon Project in the beginning. It was only when it became clear that mortal minds were no match for advanced alien technology that the Joint Staff ordered us to take you."

"But why did you keep me out?" Dykstra asked. "Even when you knew I could help."

"Because I knew you'd be doing exactly the sort of things that you *have* been doing. Those men in the *Hyperlight* are doing the mission you wanted them to do, not the one that was agreed to. All by itself your bearing inspires that sort of devotion. I've had my men chasing all over the Solar Union trying to ferret out the system you have under you—"

"What system? You think I'm at the top of a conspiracy?"

"No. *That* I could handle. It's the system of friendships you've cultivated over the course of the last century. I can't compete with that. You've made good friends and they all think they owe you something. What sort of pressure could I bring to bear against the president of the most powerful company in the Union when he has fond memories of you reading to him when he was a child?"

Dykstra did not betray his curiosity at Knoedler's indirect mention of Wayne Vander Kam. *What kind of pressure, indeed?* Dykstra thought. Somehow he was sure that the colonel had thought of something.

"The problem I have with you, Doctor, is that you're not bound by anyone or anything temporal," Knoedler continued. "You're a man of Destiny, with a big `D.' You'll always do what you think is best, and who the hell can argue with you that you're wrong?"

"I can see your problem, Colonel. But I can't say I'm sorry. I gather you knew I wouldn't be?"

"Yeah."

Dykstra made himself more comfortable in his seat, then Knoedler noticed his movements and promptly dropped the internal gravity down to Luna standard. "Forgive me. I should have done that first thing," he said, and Dykstra knew that, about this matter, he was sincere.

"That's okay. Now, there must be some other reason for your wanting to talk to me under these hushed

conditions than just to make confessions. What is it?"

"Haaa," the colonel sighed. "I need your help."

"How can I serve?" Dykstra asked ironically.

"There are some on the Joint Staff who are calling for your hide, and for the hides of your men once they return. About what you'd expect. But despite my earlier vociferous objections to your views, it's all moot now as far as I'm concerned. Besides, we have more hyperdrive ships under construction as I speak. What I have to offer is protection for your people. When your men return they'll be accused of nothing, and we won't even question that beautiful genano engineer friend of yours." He looked Dykstra in the eye. "Don't say anything, Doctor. You haven't admitted anything and I didn't expect you to. You just run your show and I'll run mine."

"But what's *your* problem, Colonel?"

"The Belt. Some on the Joint Staff also want to use the new technology to slaughter the Belt. Despite the cease-fire and our sharing of knowledge about the Phinons, no one has felt particularly inclined to tell the Belt about what you've been able to accomplish, Doctor. They feel that the new impeller technology alone gives the System Patrol an unbeatable edge.

"I read a report you once wrote about our level of technology and fighting the Belt—what do you think now?"

Dykstra looked away, out the window and at the scarred surface of the Moon. Years ago he had turned his mind to running through war scenarios against the Belt, and his had been one of the voices instrumental in ending the Belt War of Independence in favor of the Belt by demonstrating that victory by the Solar Union (victory defined as resubjugation of the Belt worlds) would come at a prohibitive cost even if luck was on their side. But now he added the new drive and the mass converter into the calculus of war and said: "They're right. It would."

"I don't want that," Knoedler said. "We can't afford to fight the Belt ever again while the aliens are out there. Any aliens, for that matter. Who knows what's out there besides the Phinons? And besides, we have a freaking FTL drive now. Who the hell is going to care about *Solar* real estate in a few years? The Belter types will be the first to head for the stars!" Knoedler was almost shouting now, then he caught himself and settled down.

"What's your bottom line, Colonel?" Dykstra asked softly.

"I want to share the Phinon technology with the Belt. But the only person they're going to trust in a meeting with us is you . . ."

"Hold it right there, Colonel," Dykstra said. "Before you continue the hard sell, I want the whole truth. I'm having trouble believing you're magnanimous enough to just hand everything to the Belt when you don't need to. To be accused of treason to show the goodness in your heart? Please."

"We have data that strongly indicates that the Phinons may be massing ships outside the Hague Limit, possibly for an invasion," Knoedler said. Dykstra was pleased that the man hadn't bothered to protest his innocence. Knoedler filled him in on the information supplied by the Belt.

"If an invasion comes, I want the BDF to be at the same technological level that the Patrol is," Knoedler concluded.

"That's better," Dykstra said, though he wasn't entirely convinced that Knoedler had told him *everything*.

"It's got to be you, Dr. Dykstra," Knoedler continued. "You're the only one with the system-wide veneration who could pull this off. You have to write Einstein's letter, only this time we're giving the bomb away."

"The Belt tried to have me killed a few months back," Dykstra pointed out.

"And only you," Knoedler said. "Look at it as a gesture of great respect."

Dykstra thought about it a moment. "I'd rather have my house back," he said. "Nevertheless, I will help you, Colonel."

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VIII

Pops was not happy with the options he had in front of him. Despite the days spent on planning the raid, he was painfully aware that they would be going in with almost nothing more going for them than wishful thinking and a prayer.

Well, what did you expect on a renegade mission, anyway?

Had this been an official expedition, there would have been more spacecraft involved, and a lot more guys, and a shitload of equipment and weaponry. As it was, they had: himself, Bob, and Rick; Pops' top-of-the-line power suit, Bob's lesser power suit, some hand weapons; and guts.

Sometimes guts were enough. They'd served him in the past.

Pops had first seen active service in the military back in the Forties, in the Central American jungles. Having decided that jungle rot was not his cup of tea, he'd transferred off planet to join the fight against the revolting Belt. He'd never gone back to Earth to live since.

Now he wondered if he'd ever see the Solar System again.

"Granted, this is a damnfool expedition. We're going to need more than a little luck to pull this off, too. But this is the scenario I've come up with given what we've been able to find out about the Phinons in the past few days." Pops was addressing Bob and Rick in the middeck. He had a display up in the holotank, and it showed that section of a typical Phinon comet that they'd physically explored.

"This entry shaft is open to vacuum on this comet, just like in all the abandoned ones. We'll ground the ship nearby, then Bob and I will enter the shaft. If there happen to be some Phinons there in suits, then we're going to try to disable a couple, hit them with PMDP, load them into the rescue bags, and come right back."

"Do you really think you'll be able to disable them, Pops?" Rick asked.

Pops restrained the urge to snap back with, "If I didn't think we'd be able to I wouldn't have brought it up," and instead said: "What we know from the encounter at Deepguard is that a person in a power suit is a match for a Phinon. And I'm more than good, and my suit is the best, complete with the deluxe weapons platform. Besides that, I intend to cut a couple limbs off the bastards right up front. Sammi doesn't need a whole Phinon for her work—just a living one. If there are any in that shaft, Bob and I are going to nab the first two who cross our path and then we're out of there."

"And if the shaft is empty?" Rick asked.

Pops sighed. Didn't Rick know enough to just sit and listen first during a briefing? "I'm coming to that, Rick."

Pops enlarged a section of the holo. "Down here are those rooms we explored. The most conservative thing to do, assuming that the entire unpressurized shaft is empty, is to go someplace where we've been before. In this case, when we get to this door, assuming there's pressure behind it, I'm going to blow it open. We'll grab whatever Phinons come drifting out, stuff them in the rescue bags, and then, again, we're outta there.

"We're not going to finesse a damn thing. We go in, we blast or cut or kill as need be, take what we came for and split."

Several hours later Bob was ready to put the *Hyperlight* down on the surface of the comet. "I don't see anything on the deepscans—nothing incoming whatsoever. So unless they pop out of hyperspace right next to us we should have time to get down without any Phinon ships spotting us. Rick says he still hasn't seen any evidence that this comet has any tracking or scanning beams emanating from it at all," Bob informed Pops.

Pops was on the middeck, going through the checkout on his power suit one more time. "And so, sailor?" he said.

"And so I'll have us down in two minutes, right next to the refinery," Bob answered. Given the capabilities of the ship, it made more sense for them in this case to put down on the surface and hide out than it did to remain hovering over the surface. The ship would be much harder to spot on the ground, and the *Hyperlight* could be back in space in a split second if need be. Which was about all Rick would be able to do with the ship anyway—no one expected any fancy flying out of a non-pilot, not in a military craft.

Pops flexed his arms. The suit felt good around him. It had sometimes been his home for days at a time and it felt as comfortable on him as nicely worn shoes. He held up the pistol in his hand. It was a scary looking thing, with pointed beam guides and trim cooling fins along the barrel. It was Pops' favorite, a '62 model FEL UV laser gun. Though his suit had lots more goodies built into it, this weapon had fond memories attached to it.

Pops felt a slight bump as the ship grounded. A moment later Bob joined him on the middeck and put on his own power suit.

Pops did the jaw move that made his faceplate lock into place. Although the inside of Pops' helmet was ordinarily a virtual vision environment, a transparent panel remained over the face, both in case the VR equipment failed, and because it was nice for your comrades to be able to look inside and see you sometimes.

They entered the airlock, the door closed behind them. Pops could hear the high hissing of air pumping out of the chamber. No sooner had the hissing stopped when Rick said over the comm: "Any time you're ready. Good luck. Come back, please. I can't fly this damn thing, y'know."

Pops looked at Bob who nodded. The lieutenant was smiling at Rick's remark. Pops opened the lock. They stepped out and their gripfields held them to the surface. Pops turned on a very dim light and allowed his image intensifiers to illuminate the way. They walked through the monochrome world to where the shaft opened on the surface. Once there, they hesitated a moment, but there was really nothing else to do except look over the lip.

Pops did. The shaft was empty.

But this time it was illuminated all the way to the bottom. "Damn," Pops said. "I really was hoping there'd be a couple Phinons flitting by right near the top of the shaft. Then we could get the hell out of here in short order."

"No such luck," Bob said. "Besides, didn't you *want* to do this the hard way?" The comment was followed by a strained laugh.

"Just try to keep laughing as we head down," Pops said. They both jetted to the center of the shaft then let the slight gravity pull them down into the depths of the comet. Again there was the myriad of doors along the way, only this time each was lighted at the entrance, though still none were open. Pops kept his attention on the view below, and Bob watched above them. Any one of those doors could open after they'd passed. And if any of them did and some Phinons came out, Pops would be perfectly content to end the descent and revert to his original plan.

No such luck. They landed at the bottom of the shaft on the huge door, still without seeing a Phinon.

"Okay, to the right," Pops said. To their eyes this comet was laid out exactly like the others they had visited, and they would not have been able to tell the difference if it weren't for the case that this time the lights were on. They proceeded slowly, Pops watching the front and Bob the rear, but still no Phinons emerged to make life more interesting.

"There's the hemisphere," Pops said finally. "Same door is open in this one."

"Guess it's our destiny," Bob said. "Maybe we'll at least find out what the hell those paired depressions are for."

They went into the airlock tube. As expected, the door at the other end was closed. Pops said, "I'm going to try to open this door. I assume there's pressure on the other side. If it won't open I'm going to rip it out. You'll have to clear out if I do that."

"Roger, Roger," Bob said.

"Don't do that."

"Sorry. Nerves," Bob admitted.

Pops reached for the triangle on the door. The instant his hand touched it, the first door closed and they heard the thunderclap of rapid repressurization.

"We're in air," Bob said.

"Tell Rick," Pops ordered.

They had kept checking in with Rick all along, and Rick had been constantly monitoring them, so he was ready with an analysis the instant Bob hailed him.

"Looks like the air is seventy-one percent nitrogen, twenty-seven percent oxygen, and a little bit of almost everything else. Pressure is 1.22 standard. Pretty rich stuff but you could breathe it," Rick said.

"We'll just stay in our suits, thank you," Bob replied.

Pops opened the door which swung easily inward. He stuck his head through the door. The room was dimly lit and his image intensifiers adjusted automatically.

This should have been the room of the twin depressions if this comet was exactly like the abandoned ones they'd visited, and Pops was fairly certain that it was. But he had trouble orienting himself to the view. Despite the image intensification, in the dim light it was still hard to discern edges and ridges, and even though after a few seconds he convinced himself that he could discern the double depressions throughout the room, the task was complicated by the fact that there was something that looked mechanical within each of the depressions. He altered his visual system to infrared imagery and had steep temperature gradients rendered as lines.

Pops suppressed a gasp—suddenly he knew exactly what he was looking at.

"This room is full of Phinons, Bob. Over a hundred. But they're not moving. I'm going to step inside. Be ready if I start firing, but I have a hunch they aren't going to even notice me." Pops moved into the room. Nothing stirred. Bob followed behind him.

Almost every depression held a Phinon, facedown, arms thrust straight out in front of the head to clasp hands with another Phinon in the neighboring depression. Each pair was immobile, though Pops was able to see with his view setting that the bodies were warm and that some kind of Phinon "heart" was

beating within each.

"Well, now just what the hell do you think this is all about?"

The words startled them and Bob gave a visible start. The two had been making their observations in silence. It was Rick, who had been monitoring Pops' visuals, making a comment. Pops said, "I was going to say, 'God only knows,' but I'm not so sure even about that."

It was Bob who noticed the first movement among one pair of alien bodies. But it was not the bodies themselves that were moving, but something on them.

"Can you see that, Pops?" Bob whispered, pointing.

Pops could.

On the back of the right shoulder of both of the Phinons something was detaching itself. As his vision system improved the view, Pops' first impression was that an eight-legged starfish was lifting itself off the shoulders and trying to stand up. As he watched he substituted "mechanical spider" for "starfish" in his mind, and was fascinated as the little entity actively pulled itself up out of the Phinon's flesh, shedding bits of skin and strings of wet flesh. Once entirely free, the tiny hydraulic spider set off down the right arm of the Phinon body.

The spider on the paired body, freeing itself at almost exactly the same moment, did likewise.

"Fascinating," Pops and Bob heard through the comm. Rick sounded entranced.

"You know, I believe there's a section on these things in the Phinon material," Bob said. "They found this thing on the dried out Phinon Michaels killed, but they couldn't figure out what the hell it was."

Each spider continued down the arms, crossed over respectively to the other Phinon of the pair, and then situated itself again by the right shoulder. Once there, they seemed to be going about trying to rebury themselves.

"This is a mating chamber," Pops said. "By God, they're mating. They go into a complete stupor so those spider things can get loose and crawl to where they need to go. That's how they exchange DNA."

"I think you're right," Rick said. "Somehow I don't think Phinon porno shows are likely to be a hit, though."

Pops noticed that many of the other pairs now showed spiders making their short pilgrimages and decided it was time to get going.

"This looks a little too easy, but I think we should gather up one of those frozen pairs and haul ass," Pops said. "If they start moving we'll try the PMDP."

The Phinon pair closest to them was nearly finished mating, if that's what it was, so Bob and Pops waited until the two spiders seemed to be dug in. "I just thought of something," Bob said. "What if the spiders don't stay put, but drop sperm or something and then return to their original bodies?"

"Do you want to wait and see?" Pops retorted. "Could take days for all we know."

"I'll take the closest one," Bob said. "We might have to pull them apart, though. Looks like they're holding on to each other pretty tightly."

"Of course," Pops observed. "Haven't you ever been in love?"

"Do Phinons love?" Bob asked.

"I don't know. Their sex looks pretty mechanical to me," Rick said, laughing at his own joke.

Bob stepped next to the Phinon pair and tried to separate the hands. "Geez, it's like trying to pull apart a heavy chain," he said, and cranked up his suit power. At several tons of force the hands came apart, actually shattering and exploding at the release of energy rather than ungrasping, and sending a loud ripping noise echoing through the chamber.

The other pair of locked hands unclasped then, and the lights came on.

Armed Phinons were pouring in from the door on the far side of the room, spreading out over the floor, walls, and ceiling, moving on three limbs, holding a weapon in the remaining one, which with some of them was a foot.

"Oh holy damn!" Pops said. He turned and sent a grenade into the far door. The concussion of the explosion sent Phinons flying and even bounced Bob, who was not ready for it, off the closest wall, but he recovered quickly.

The separated Phinons were still in a stupor. "Get them in the bags, Bob. Fast! I'm going to blow out that airlock once we have 'em secured." Bob got to it and Pops watched the other Phinons in the chamber. They were picking themselves up from the explosion, and Pops nailed them one by one with his laser. Only one got off a shot of its own, and then only at the instant that Pops hit it with his own burst, and the shot hit the wall above their heads, exploding the rock and pelting them with gravel shrapnel.

Bob had the two Phinons loaded into the rescue bags. Pops saw that more Phinons were again coming through the destroyed door, and he sent another grenade in that direction. This time Bob braced himself

before the concussion hit.

"Stand clear," Pops ordered, and he fired down the short airlock tube. He watched as the door on the end glowed red then bubbled outward and burst. This caused the inner door to immediately reclose as the pressure dropped, but Pops grabbed it and tore it right off its hinge and the air whooshed through the tube.

The resulting wind pulled Phinon breeding pairs out of their depressions, and though they were tossed about the chamber, they showed no sign of waking up, remaining as stiff as planks in a tornado. The few living Phinons from the far door were too busy trying to breathe to fire at them.

"Through the tube!" Pops ordered, and Bob took one of the rescue bags with him. Pops followed with the other.

Once in the major tunnel, the two hit their jets and tore off back toward the main shaft that led to the surface.

Once there, Pops looked up. He could see no stars.

"They closed the outer door," he said. "Shit!"

They he noticed that dozens of doors along the tunnel were opening.

"We can blast through the outer door," Bob said. He was still looking up.

"If we get a chance," Pops said. "But they're after us."

"Oh shit," Bob said, himself now seeing the doors opening.

Pops checked his suit indicator. They were still in vacuum. That was too bad. He'd hoped the Phinons would start filling up the space with air, then another good grenade would blow away the outer door and he and Bob would be all set. But this time the Phinons that began emerging were wearing suits, and carrying arms.

"You head upward with the bags, Bob," Pops said. "And blast your way out. I'll hover down here just inside the shaft and hold them off. Otherwise they'll cut us to pieces on the way up."

Bob hesitated. "No, I'll hold them off. You take the Phinons back to the ship."

"My suit is better than yours, Lieutenant. And you can't abandon the ship. She's yours. Have some faith. I'll follow along as soon as you're clear," Pops said. Pops handed over his Phinon.

In return, Bob detached his ammunition cache and handed it to Pops. "You'll need this more than I will," he said. Then Bob clapped him on the shoulder and set off, holding both Phinons in one hand, his other hand free to shoot.

Pops hovered near the wall of the shaft. A spacesuited Phinon with a weapon appeared. It was the classic Phinon hand weapon—an X-ray laser with a beam of adjustable length. The beam was glowing a bright white, waste energy trickling out, looking like a three-meter-long, white-hot lance. Pops picked off the Phinon with his laser.

Then another came into view. And another.

Pops anchored himself to the wall. He fired a grenade that exploded against the big door directly at the bottom of the shaft, but without atmosphere down there only bits of shrapnel were left to whiz through the vacuum and strike a Phinon or two.

He settled for picking them off with the laser as they came into view. This time none of them were fleeing when one of them fell. *Guess there's no flight when they're in their own hive*, Pops thought. He knew he was likely to soon be overwhelmed. Of course, there was one other thing Pops had left that he could do, but he'd have to wait until Bob was clear before he tried it.

So the Phinons kept coming and dying and coming.

And coming.

* * *

Back aboard the *Hyperlight*, Rick had not noticed immediately when the Phinons appeared. He had been watching Bob's attempt to separate the hands, and when they came apart, he'd exclaimed: "Holy smoke. I got to see that again."

Without delay Rick had switched the screen to a slow motion replay, and watched as the intertwined fingers refused to disentangle, and finally they all simply sheared away at once.

When he switched back to real time, he saw that the lights had come on and Pops and Bob were in the middle of a fight.

Don't call them. They're pros. They don't need to be interrupted, he thought.

Rick watched through Pops' suit the Phinon onslaught and the subsequent slaughter being meted out by Pops. He had to restrain himself from calling out to the commander when he noticed an alien that he was sure Pops had missed, only to watch said alien die an instant later.

Rick watched their flight down the main tunnel. He watched as more Phinons began to emerge. He overheard the discussion Pops and Bob had about who should stay. He watched Bob fly up the shaft with the two Phinons, then switched screens and watched Pops shooting at off-screen Phinons when Bob turned back to look.

Bob called. "Get into the pilot's bubble, Rick, and cover me with the antipersonnel laser once I clear the shaft. Shoot anything that moves that isn't either me or Pops."

"Yes . . . Lieutenant," Rick replied. This was actually the first moment of the trip where Rick had *felt* the weight of command upon the shoulders of his friend. "And be careful, Bob. I can't pilot the ship home alone."

"If something happens to both me and Pops, you know how to set the self-destruct, right?" Bob asked.

"I rigged it, remember? The mass converter will overload. We'll take the whole comet with us and they'll even see the fireworks back home."

* * *

Bob slowed rapidly as he approached the door covering the shaft. He jetted along beneath it, inspecting the locking mechanism on one side, and the hinges on the other, and came to a decision.

He looked at the Phinons through the transparent quadrant in each rescue bag. They still looked soundly comatose.

Near each of the myriad tunnels intersecting the shaft were small projections. Bob picked out two at random about ten meters below the door on the side away from the hinges and hooked a Phinon to each. Then he jetted back up to the hinges and set a charge under each one. He forced himself to take extra time positioning the explosives to guarantee that the first blast would be the only one.

Bob looked down the shaft once more. Pops was still firing, but far more often now. "You holding your own, Pops? I'm about to blow the door. Watch out for shrapnel coming down."

"That's the . . . least of my worries . . . right now," Pops replied.

Though concerned for his friend, the best thing Bob could do for Pops right now was to get the door open. "Here goes," he said.

Bob had dropped back down to where he'd left the Phinons. He detonated the charges. The silent explosion threw chunks of ice and rock out into space. He looked up and was pleased to see the dented circle of the shaft door tumbling rapidly in the direction of Ursa Major, right in the middle of the star-

filled circle.

"Success, Pops! You, too, Rick. I'm on my way."

Bob collected up the rescue bags, then thought he felt something move inside one of them. For a moment he froze, then slowly brought the bags closer to look inside. He saw only a comatose Phinon in the first bag. In the second, the Phinon stared back at him.

Startled, Bob reflexively held the bag as far away from his face as he could, but he continued to look inside and watched as the Phinon lifted its damaged left hand in front of its face and looked it over. It did not seem to be in pain and after a few seconds ignored its hand and started testing the strength of the rescue bag, as if it had simply noted the fact of its hand's demise, but didn't actually care.

It didn't seem to have noticed Bob at all.

It pushed out hard on the rescue bag. "Shit. It's trying to break out," Bob whispered to himself. Briefly he considered shooting it, then realized that if it broke out, it would simply die. The rescue bag was the only thing between it and vacuum.

What an idiot I am! He remembered the ampules of PMDP, retrieved one, and drove the stinger through the material of the bag. The bag would reseal itself from such a small hole.

The Phinon ceased moving.

You were right, Sammi. He drove another ampule into the other Phinon even though it had yet to show any signs of waking up.

Bob found it more than a little ironic that he had just saved a Phinon's life. He never thought he'd ever be inclined to do that.

The firefight below was still going on. Bob didn't want to distract Pops again by calling, but he was afraid for the old man. Pops was firing continuously now, yet there seemed to be no shortage of Phinons to refill the ranks.

He called anyway. "Pops, can you rocket up here?"

Pops was short of breath. "No. Sorry, Lieutenant. There's too many. They'll . . . cut me down from below if I give them . . . half a second to aim."

"I'm coming back down," Bob said. "The door is gone, now. I'll help and we'll both get out of this."

"No, God damn it! You're the only other pilot. I don't need the . . . freaking cavalry! Get those Phinons to the ship. That's what we came out here to do. I've been in . . . deeper shit than this."

* * *

There were plenty of Phinons to shoot at.

Pops had lost track of how long he'd been shooting. His FEL UV laser had long since lost its charge. He was also out of grenades and had fewer than a score of bullets for his slug thrower. He was using the suit laser now, and with its power pack, he could keep firing forever, or at least until it overheated.

Rick called him. "I've been watching Pops, and doing a count. They're definitely thinning out. You're going to get out of this, old man."

"Thanks for the . . . vote of confidence," he said. But then after another minute he decided that Rick was right, and thirty seconds after that decided he could make a dash for it.

Pops took three more shots at the closest Phinons then pushed off into the center of the shaft.

But when Pops looked up he did not ignite his jets.

Above him, seemingly every door to every tunnel that intersected the shaft was open, and suited Phinons were pouring out of every one.

Pops estimated that somewhere between fifty and a trillion aliens were dropping towards him. They entirely blotted out the stars above.

"Aw, shit," Pops said. "Bob, where are you?" For some reason, the lieutenant didn't answer. *He should be back to the ship by now*, he thought. *Or damn close*. "Rick, do you know where Bob is?"

"I can't raise him either," Rick replied.

"Keep trying. And forgive me, Rick," Pops said. "But I'm going to have to kill myself."

"What? No!"

"Do you see what I'm looking at?"

"Oh."

The detonation of the power core in Pops' suit sent a sword of flame, and hundreds of glowing Phinons,

kilometers into space.

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IX

Sammi did not like trying to sleep in normal gravity. Despite having grown up on Earth, where she had always slept in a one-gee field and never even thought about it, since her arrival on the Moon, and particularly, since the apartment she and Steve had shared had variable gravity controls and could nullify the artificial one-gee field extant throughout Luna City, she found sleeping in her bed at the High Command to more often be a chore than a refreshing respite. Her dreams in particular were often a daunting difficulty to be endured.

Like many exceptionally creative people, Sammi had an active dream life. Oftentimes it was in dreams that she would solve technical problems that had proved intractable during waking hours. One of her biggest delights when she went to live on the Moon was discovering, with Steve, that sex in one-sixth gee was much like sex in dreams in that the people involved had nearly no weight. But now that she was sleeping in one-gee fields again, even the weightlessness of sexual dreams had departed, and the vague eroticism of what dreams remained seemed to involve lovemaking with faceless slabs of meat.

At this moment she was again dreaming, and though the images that played through her mind would not have looked sexual to an outside observer, within the dreamscape of her mind there was an underlying charge of desire waiting to burst forth. Strangely, what Sammi was seeing was a military base perched on a cold, lonely rock somewhere out in deep space. Her mind told her that this was Slingshot, but what she saw didn't look anything at all like the original had. But no matter—there were other lessons her mind had to teach her in this dream.

As she lay there, she started to toss in her bed, because the views were starting to hit her in sensitive emotional areas. She saw great System Patrol battleships cruising out of the darkness, and then there appeared from the blackest depths the characteristic bizarre shapes of Phinon spaceships, just like those that had attacked Slingshot, only in this case there were hundreds instead of two. Soon the alien ships were blasting away at the base, and in a strange twist out of the ordinary, she felt she was one of the battleships, but that her "legs" were caught in the muck of dreamsleep, where nothing she could do would result in anything other than slow motion. Try as she might, she could do nothing to stop the Phinons from wreaking havoc on the base.

She saw a lifeboat emerge and fly into the stars.

In the dream she was suddenly released from her incarnation as a battleship, and now she was a free spirit flying loose in space, observing the appalling tableau. She chased the lifeboat, caught up with it, was about to enter it when it turned around, in her dream violating the laws of momentum, but no matter. It was heading back toward the base, and again she chased it, trying to catch up, but having more trouble this time.

She had to tell Steve not to do it. She had to tell him to flee this time, to not try to take out the alien ship.

To come back to her and make her happy again.

She could see the Phinon ship, firing away at the base. She could see the lifeboat ahead of her, continuing to accelerate. She redoubled her efforts and slowly she closed on the lifeboat. As a dream ghost she was able to enter through the drive tubes. The plasma coursing through her felt tingly. She emerged from the engine into the central room, and looked up front to see a figure standing at the pilot's station, peering out the window, delicately touching the controls.

"No, Steve! Turn aside! Don't do this!" she screamed, but there was no sound. She tried to rush to him, but now she had legs, and they were caught in the slow motion muck, and she had to trudge forward.

Slowly she got closer. If only she could look in his face she could get him to stop. She could see the approaching form of the Phinon ship growing in the window.

Finally she reached him. She put her hand on his shoulder and jerked him around. She stared into his face.

It was the face of Lieutenant Robert Nachtegall.

"Aaaugh!" she screamed and jumped up in her bed, the dream dissolving into her gloomy room.

"Oh, shit," she said quietly. "Oh . . . Oh . . ." The clock said 0547. That was close enough to morning for her, and she got out of bed and went for a cup of coffee. Unfortunately, the autochef had yet to make it since Sammi ordinarily didn't get up for another hour, so she overrode the controls to get the coffee started, and tried desperately to forget the dream by thinking about her work while she waited.

Now that brought a smile to her face. She had made tremendous progress on her genanites, had pushed the envelope of the whole genano field well beyond what she would have thought was possible within the next ten years only a few scant months ago. Too bad she couldn't publish any of her results until after the Phinon situation was settled. The best she could do was to tell Andy, but try as he might, he was not genano engineer enough to keep up with her. She recalled her civilian view of military scientists, how she used to look down her nose at them as being less than competent. But now she knew what it was like from the other side, and understood the kind of frustration so many of them must have felt at doing tremendous things in science but being denied the emotional satisfaction of publication, and having thus to have to put up with the bigoted—yes, that was the word—views of the academics.

She wondered now why she'd ever felt that way. The minute she walked into the labs at the High Command, she saw the type of equipment that she was to be turned loose on, and knew that the top-of-the-line stuff she'd been using on the Martian Terraforming Project was primitive in comparison. Indeed, the military could afford to buy the best—and hire the best, for that matter. No, what had separated the

academics from the military scientists had never been competence, only ideology. Even poor Andy Fine was no slouch as a biologist.

Since Sammi had no access to live Phinons, she'd had to work on making "wide-spectrum" genanites that could get along in any of the possible Phinon environments that she could imagine. She'd managed to eliminate the need for a bacteriological host. Once she had live Phinons on hand, then only some tailoring would be necessary to optimize her genanites for their task.

She was convinced that she'd been entirely successful.

Now, if only the guys would get back.

The coffee was almost finished, so while she waited the final minute, she went to her workstation and tried to call Dykstra, just to ask if he'd heard any more about where their friends were. But there was no answer.

She shrugged and got herself that cup of coffee.

Where could Bob and the others be? What did any of them know about hyperspatial journeys? As she sipped her coffee, she reflected on the miracle that had taken them from nothing to FTL drives in only months. And not just theory, but an actual spaceship. Of course, the ongoing miracle of technology had helped a lot. Despite Dykstra's genius, and also that of Hague, modern computers and computer-controlled manufacturing had much to do with their success. Had Oppenheimer had modern equipment, he might have built the atomic bomb by himself in a few months.

Technology had made it easier to jump from the known to the unknown, and make it known, in record time, and she could conjure up a thousand scenarios to explain why the guys were late in returning. Or even why they'd never return at all . . .

Enough of that. She left her room and went to the lab.

She checked up on her cultures, a routine matter in which she noted the levels and variations in various metabolic processes, and as expected, all was well. She sat down at her laboratory workstation and went to work on her PKSs. *Phinon Kill Scenarios. Yeah!* she thought, but barely noticed that she did. The work on scenarios could have been done just as well on her home workstation, except that the Patrol would not let any of the information on the computer out of the lab, period. Her lab workstation had no outside connections at all. But this was fairly typical in the ultrasecret labs.

There was still a question as to just how the Phinons could best be exposed to her genanites. Her assumption was that sooner or later a missile carrying her bugs would intercept a Phinon ship and deliver its payload inside. Then what?

Her best scheme at present was to use the two different strains of genanites that she'd thought of earlier, though now she called them the "virulent pausers" and the "acute infectors." However, she'd lately figured out a way to make one strain serve both purposes.

Once the genanites were inside, upon first generation divisions, roughly half of the next generation would become the pausers, and the other half the infectors. Thus, some of the Phinons within the ship would show the symptoms of infection immediately and begin dying promptly. The remainder would be infected, but the genanites wouldn't activate their "rusting machinery" until a certain amount of time, an amount yet to be determined, counted off by tiny, incorporated biological atomic "clocks," had elapsed. This would give them time to return to their homes—assuming they had homes—and infect more Phinons there.

The mechanics of this scheme, though simple to explain, were fiendishly difficult to accomplish. Sammi had to design the genanites so that once a Phinon was infected with one type, the other strain would leave that individual alone. Otherwise, all of the Phinons would die from the immediate form. One thing that worried Sammi was that the Phinons left alive wouldn't flee. Now that would be a problem. Perhaps when the *Hyperlight* got back they'd have enough information about the Phinons' distribution throughout the Oort cloud so that another infection scheme might present itself.

Today she wanted to work out what would happen after the Phinons in the Oort cloud were infected. She supposed that they'd all either die out there or flee trying to get away.

And go where?

Nobody knew where the Phinons had come from. It was obvious that they had evolved on a planet, because their bodies were clearly designed with gravity in mind. In fact, they still lived with artificial gravity fields in their ships, despite occupying a living space where fractional gee surface gravities were the norm, and thus must have had artificial gravity almost right from the beginning of their leaving their home planet.

She'd had conversations with Dykstra on this point. He was certain that the Phinons had never developed a sublight drive that worked within the Hague Limit, and so over time probably gave up living in or even utilizing the Hague volumes around stars at all. They probably occupied cometary haloes spread throughout interstellar space—with their hyperdrive they'd never notice the difference when they crossed the subtle gravitational divide that separated far-flung comets into those that belonged to one star or another. And that brought up the question of the extent of Phinon occupation. Given time, they could occupy the entire interstellar volume of the galaxy.

Sammi called up a view of the galaxy, and a beautiful three-dimensional image, slowly rotating for effect, appeared in the holotank. *Okay, let's just suppose you guys do own the whole galaxy. How long will it take to get rid of you all?* She could ignore the fact that Hague volumes contained no Phinons—on this scale Hague volumes were insignificant. She thought about the conditions that were supposed to

apply at the galactic core, tried to figure out how close the Phinons could live to that hellish gravitational/electromagnetic maelstrom, and guessed at a correction.

The rest was easy. The Phinon hyperdrive allowed a speed of $24c$. The galaxy was just over one hundred thousand light-years in diameter. Factor in the added time required by the uninhabitability of the galactic core, and other technical considerations *known only to me*, she thought, and out came a figure very close to five thousand years.

Just for fun, Sammi directed the Milky Way image to play out the scenario, with infected sectors going black. She linked the time element to the galactic rotation rate. Five minutes equals two hundred million years. *Ready, set, go.* The whole galaxy went black almost instantly.

With immense satisfaction Sammi ran the scenario again and again. *That's it. You can all die for killing Bob— Oh!*

She shut off the display. The holotank went dark and she was able to see her reflection in the side of the tank. *Who are you? Just who the hell are you? What happened to that idealist who wouldn't let Major Moore recruit her to kill aliens?*

In a fog, she walked back to her room. She tried to call Dykstra again, but still there was no reply, and no autoindicator of when he'd return. She then checked her own messages and there found a short one from Dykstra indicating that he had business off Luna and that he'd call her when he got back.

Dykstra was the only real friend she had at the High Command. And right now she desperately needed to talk to a friend.

She made another call. It was answered promptly. "Martha," Sammi said. "I want to visit for a few days. I mean, I *need* to visit."

* * *

Nikki Le watched through the window as the Belt ship lifted off from the surface of the tiny Earth-crossing asteroid where she, Knoedler, and Dykstra had just finished their meeting with the representatives from the Belt. For her, much of the meeting was a mystery since she wasn't privy to it. She was along simply because she was the only person handy who had actually had an encounter with the Phinons and Colonel Knoedler had decided she should be there to regale the Belters with tales of her adventures, such as they were. But once she finished telling her side, she'd been sent to her room to cool her heels until the rest of the—what? negotiations?—had been completed.

There was nothing special about the Belt ship that had brought the two representatives. It was just a simple inner system transport, standard transportation for jaunting around space from Mercury to the Belt. The ship she was in wasn't much better, just a military light transport, though defanged for this

meeting (although there were some peculiar pods attached to the stern that she didn't know the reason for). And the rock they were on, just a run-of-the-mill stone in an elongated orbit coming in closer to the Sun than the Earth at perihelion, intersecting the Belt at its farthest extent, right now handily between the orbits of Earth and Mars.

But she had been astonished at how fast they were able to get there.

She was sure that she had just been at a meeting that would be discussed at length and ad nauseam in the history books for years to come. Provided the human race had a future—the Phinons might have something to say about that.

The Belt ship thrust away on repulsors, then lit its torch and soon was lost among the stars.

Lost among the stars, that's how she had felt on Deepguard after Luke was killed. There had been nothing left but a crater when she reached the site of the laser batteries, and she'd gone into the remains of the base, cried for what seemed hours, prayed, and slept. The next day she put on her professional self and tried to find a way to send a laser message, but it was simply impossible. The day after that she was rescued. She and Luke hadn't known that the System Patrol had nearly a fleet of military and scientific vessels on the way to Deepguard to study the aliens. She'd had no idea that the Phinon Project existed.

She'd been whisked straight back to Luna, was reassigned to the Phinon Project, and spent all her time being debriefed. But lately she'd been doing nothing. She knew too much to go back to an active duty assignment on a battleship, but not enough to help the geniuses that made up the cast of the Project. Then Knoedler had requested her services and told her that he had a plan for her to ultimately visit every spaceship crew in the System Patrol to brief them on the Phinon threat.

But first . . .

Someone knocked on her door.

"Yes? Come in."

Dykstra opened the door. "You may rejoin us, Nikki. I'm sorry we couldn't let you stay with us. But believe me when I say it really was in your best interest as well as in ours."

"That's okay, Doctor. I'm just a measly little ensign, after all. The colonel can order me to swab the deck now if he'd like."

"Well, the deck *is* kind of dingy," she heard Knoedler say from behind Dykstra, then the colonel came into view.

"No disrespect intended, sir," Nikki hastily said, but to be honest, she didn't really care what he thought.

Recent experiences had given her a more realistic view on what counted, and what didn't.

"Oh, sure there was," the colonel said, smiling. "I used to make those kinds of comments, too. Still do, as a matter of fact." He smiled again.

"So, am I guilty of treason now, too," Nikki blurted out. "Or is my being kept in the dark going to save me prosecution in the event you two get caught?"

Dykstra turned to the colonel. "She's quicker than most of the people on your staff, Colonel Knoedler." Then he looked at her. "And certainly a good deal more honest. Perhaps we'd better 'fess up to the ensign, don't you think?"

"Perhaps. What is it you suspect, Nikki?" Knoedler asked.

Suddenly it's "Nikki" now, eh Colonel? But she found she didn't mind Knoedler's sudden foray into familiarity. "What I suspect is that the High Command doesn't know we're here, and would be damned upset if they found out that you two had been meeting with those representatives from the Belt, cease-fire notwithstanding. Am I on the right track?"

"You'll know eventually," Knoedler said, not looking happy.

Dykstra laughed. "Oh, Colonel. She's got us lock, stock, and barrel. Nikki, you just want to know the whole story, don't you?"

"Yes."

"Why?" Dykstra asked.

"Vengeance. The Phinons killed someone dear to me. I want to be at the front of the phalanx that does them in."

"Okay," Knoedler said. "I'll give you the crisp little version. Although I'm not acting entirely on my own, I'll take the fall for those above me that sanctioned this meeting if things don't go right. The bottom line is that some of us think that the Phinon threat is the real danger to the Solar Union, not the Belt, and we want their help in dealing with the aliens. All of the issues separating the Union and the Belt will be moot once we can go to the stars. We have a cease-fire now and we've been sharing data, but we haven't told the Belt about several new technological advances that we've figured out from our collection of alien artifacts. And unfortunately, there are plenty of folks who want to use the new alien-derived technology to annihilate the Belt government once and for all. Dr. Dykstra and I are not among the latter group."

"The new technology? Like the drive for this ship?" Nikki asked.

"The colonel surprised me with that, too," Dykstra added.

"How did you know . . . ?" Knoedler began.

"I looked out the window, Colonel. I can see Mars. I can see Earth. I know about where we must be. To get here as fast as we did would have required one hell of a drive flame. And yet this is a secret mission . . ."

"Shit," the colonel said.

"Anything else you want to know, Nikki?" Dykstra asked.

"Yes. What's the conflict between the two of you? I've picked up a word or two here and there during the flight. You both agree about how to deal with the Belt, but there's something else about which you disagree, um . . . I'd say violently, but you're both too professional for it to come to that."

"You're right, Doctor," Knoedler said. "She belongs on my personal staff. Ensign Le, you're promoted to, er, Lieutenant Commander, and we'll flush through the paperwork once we get back. And you're not going to waste time visiting ships in the fleet. You're going to be with me for the rest of the war."

"Which one, Colonel?" Nikki asked, doing her best to take the changes in stride.

"The one with the Phinons, Commander."

They had wandered out of Nikki's room and into the middeck. "Now that the commander is your personal assistant, are we free to disclose the nature of our disagreement?" Dykstra asked. "I would be very interested in her opinion. I've already heard from the only other human who fought a Phinon face-to-face. I'd like to hear about it from Nikki."

"I believe a briefing is in order," Knoedler said. "Me first."

"Let's look at some recent history, Nikki. A little over two years ago our first manned probe to the Oort cloud is met by hostile aliens who cripple the ship, board, then go about searching the ship in what can only be called a provocative manner. The one person on board manages to kill one of these aliens—one of these aliens with a technology one genius I know," Knoedler said, nodding at Dykstra, "describes as being no more than a century ahead of ours—with a spear, no less. The remaining alien flees without ever firing another shot, and doesn't even bother to destroy the probe as he's leaving. A bit later we retrieve the man and some alien artifacts from which we eventually obtain the secret of total mass conversion."

"Two years go by without another peep out of the aliens, and then they hit a secret base out sixty astronomical units from the Sun. That they even found the damn place is astonishing, but it was one of the few spots out that far—beyond the Hague Limit, a physical barrier no one but physicists knew anything about until recently—where accurate measurements of their ships arriving might have been taken. The two ships proceed to blast the base, but then, oh joy, one of our lifeboats manages to ram one of the alien fighters, manages to hit it just right so that the ship is destroyed except for the drive unit, and then the other, true to form, flees, again without finishing off the base, which it certainly could have done by then. And after that encounter, we come away with an alien hyperdrive motor and within—what was it, *two* months, Doctor?—we have a theory of FTL travel, and very shortly after that, an actual working hyperdrive.

"And then, as if all this wasn't miracle enough, Dr. Dykstra informs us that not only do we have a hyperdrive, we have one that's better than that of the aliens, and a nifty sublight reactionless drive for use within the Hague Limit that the aliens seem to know nothing about.

"Gee, aren't we lucky?"

"Congratulations, Colonel. That was an admirably suspicious way of recounting the past," Dykstra said. "You almost have me convinced."

"And your conclusion, sir?" Nikki asked.

"The Phinons gave us the hyperdrive. I don't know why, but suspicious bastard that I am, I think they have some nasty way to destroy hyperdrives. The invention is so damn useful that we'd have to employ it if we want to get beyond the Solar System, and we'd absolutely need it if we wanted to fight the Phinons. I fear that if we come to rely on their hyperdrive, and invest totally in building spacecraft employing it, then we're ripe for an attack that could take us out in the proverbial 'one blow.' "

"But how did they know our lifeboat would ram their ship?" Nikki asked, looking for a hole in the colonel's reasoning.

"They didn't. But a ship didn't have to ram. That's just what happened in this case. For all we know, had MacTavish not turned around, in another minute one of our missiles would have gotten their ship in a different miraculous strike, again leaving that hypermotor intact."

"How about that reactionless drive? Dr. Dykstra says they don't have it."

"He doesn't know that for sure, Nikki. Besides, I'm willing to concede that they hadn't intended to give that to us. That's why the ships that hit Slingshot didn't use it. But they really didn't have any way of knowing that we had a scientist of Dykstra's caliber on the scene who could figure it out for us even from the deceptive equipment they let us recover."

"Thank you for the kind acknowledgment, Colonel," Dykstra said.

"Yeah, right. Well, it's your turn, Doctor."

Dykstra turned to Nikki, and it was almost like he was looking right into her. She hadn't noticed that look from him before—she wondered if it was something he could turn on and off at will.

"I agree with the colonel's recitation of the facts, but believe his view is overly tainted by contact with the nefarious minds of other enemy human intelligence organizations, and also from a complete ignorance of what the Phinons are like. That is, from what is revealed about them by their technology, and from the impressions of them formed by those who have actually been in contact with them," Dykstra began.

"I'm not ignorant of those things—" Knoedler began.

"You're not ignorant of what it says in the reports, Colonel. That is not to be confused with a genuine understanding," Dykstra snapped, interrupting. Nikki was impressed by Dykstra's sharpness, both in tone and of wit. But for some reason she felt sorry for Colonel Knoedler. Here was a man entrusted with some of the deepest secrets of the System Patrol, and burdened with some of the greatest responsibilities, but to a man like Dykstra, these were as nothing. And Dykstra could make you feel that way about yourself, too.

"In any case, it would be pointless to reinterpret the colonel's history lesson. Suffice it to say that where he sees devious duplicity, I see genuine data deeply revealing of the Phinon mind."

"I see," Nikki said. "But those differences don't account for what your fight is about, do they?"

"Um, that was a policy thing," Knoedler said. "Once we had a hyperdrive-equipped ship ready, I argued that we should only test it for one day, that being my compromise between us gathering information on the drive and minimizing the chances that the Phinons would find out we've built one. Dr. Dykstra argued that we should send that ship on an intelligence-gathering operation to the Oort cloud, including the possibility that our soldiers would collect Phinon POWs. We were supposed to have reached a compromise on a two-day shakedown cruise. But the good doctor sent the men to do it his way."

"To that I have not admitted," Dykstra said. "The *Hyperlight* is more than three weeks overdue. We have no idea why. The colonel forgets that even if I had sent the crew on 'my' mission, they would have returned by now. But in actuality, both Colonel Knoedler and I were advocating what we perceived to be a conservative course of action. I felt it was more important for us to find out about them than it was for us to prevent them from finding out about us. Besides that, I don't believe that the Phinons are sufficiently like us for them to even consider the sort of plot that the colonel fears."

"Yes, and every damn time I ask you about that you go fuzzy on me and won't explain yourself clearly,"

Knoedler interjected. "I only have experience with humans, Doctor. That's all any of us *mortals* have."

"Not so, Colonel. Nikki has a fuller perspective than that. So, Nikki, I'd like you to tell us what it *felt* like to fight that Phinon. What were your perceptions of it, of its mind, of its feelings?"

Nikki saw the image of a Phinon, transfixed, like a deer dazzled by headlights. She turned to face Knoedler. "I'm sorry, Colonel," she began. "But I think Dr. Dykstra is right."

* * *

Sammi used to tell her friends that Martha's home would feel warm even if the thermostat was turned down to absolute zero. The interior of the apartment Martha shared with her husband was done in earth tones, the furniture was cushiony and country (sporting print patterns dominated by farm animals and harvest scenes), and wood predominated (fake wood, of course, but damn hard to tell the difference from the real thing). On one wall was a large fireplace capable of holographically duplicating anything from a roaring blaze to a mellow intermittent single flickering flame, or even a bed of glowing coals if one was in the mood.

Even the "windows" of the apartment contributed to the warmth, playing a yearlong loop of scenes showing an outdoors typical of the Republic of Currier and Ives, changing somewhat in sync with the seasons as experienced near the 45th parallel of the North American continent. At the moment, the trees "outside" were ablaze with color, and leaves were leaping to freedom with every breath of wind.

Sammi was sitting on the couch, looking "out" the window, but her mind was a million miles away.

Martha emerged from the kitchen with two crystal mugs of hot cider and brandy. Martha herself looked much like her furniture, or a comfortable pillow, soft and cushiony. Steve used to describe her as Sammi's "older and wider" friend. Despite her looks, she was a topnotch chemist with the Martian Terraforming Project, and Martha had adopted Sammi as a surrogate daughter when they first met at the Project's labs.

"Here we are, Sunshine," Martha said cheerfully, handing one mug handle first to Sammi then seating herself beside her young friend on the couch. She took a sip of her drink. "Ah, delicious. So much depends on getting just the right cinnamon stick. Now, tell Momma Martha what this is all about. And you really should make a better effort to come see me more often. I think it would help you a lot."

"I know," Sammi sighed. "But my work is so . . . hectic. Y'know?"

Martha hated the System Patrol because she'd lost both her father and her daughter to Patrol missions that had gone awry. She had been tremendously hurt when Sammi had also agreed to work for them, and it hadn't helped that she could not be told the details of what had convinced Sammi to leave the Project and go to work for the military. So they never talked about what sort of work Sammi was doing, nor did

they discuss the Patrol. But it was okay to talk about personal things and feelings.

And men.

"So why did you need to see me so badly?"

"I'm having dreams about . . . another man." As she spoke Sammi tried to bring herself into the here and now, but even with Martha sitting next to her there was an air of unreality about things. She knew her mind was trying to keep her detached from the reservoir of emotional pain that had pooled in the depths of her soul.

"Tell me about the dream," Martha prompted.

She recounted an edited and factually false but emotionally accurate version of last night's dream that conveyed what Sammi had felt but left Martha in the dark about the classified existence of the Phinons. Keeping secrets was a tremendous nuisance and Sammi resented the necessity with every half-truth she uttered. "Somehow I feel like I'm betraying my husband," she concluded.

Martha said, "So tell me about this `Bob' person. What's he like?"

Sammi thought about Lieutenant Nachtgall; his hair, his face, the way the tendons in his neck arranged themselves when he turned his head, his eyes, his hands. She thought about things he'd said to her, his attentiveness after Dykstra had gone down to Earth. Then with a coyness and a smile that surprised herself she said, "Everything about him says, `This is a *man*.' "

Martha laughed. "I see."

"It's funny. I thought Steve was a man, too, obviously. But Steve was so attractive to my mind, so brilliant and intricate. Bob's bright enough, but my attraction to him is, is—"

"Centered lower?" Martha asked helpfully.

"I was going to say `visceral,' " Sammi said.

"Samantha," Martha began, and suddenly there was a sadness in her eyes, Sammi noted. "How long has it been since you last made love?"

"Well, it was when . . . when . . ."

The tears gushed out in a flood, unexpectedly, as she remembered her last time with Steve. Suddenly there was no escaping her feelings, and her lame attempts to close the floodgates failed utterly. Sobs

were torn from her and Sammi cried like she had not cried since that night Dykstra had come to tell her the truth about her husband's death.

Presently the flow of tears subsided and Sammi found herself with her head on Martha's breast, the older woman gently stroking her hair like all moms have done with daughters through the ages. "I'm sorry, I'm sorry," Sammi choked out, ashamed at herself for losing control, yet not lifting her head nor releasing her embrace of her friend.

"It's okay, Sunshine. It's okay. When you went to work for the Patrol you left your friends behind, you left all your support behind, and you thought work would fill the empty places. It couldn't, little girl. Only other people could do that."

"I need to blow my nose," Sammi said.

After five minutes in the bathroom Sammi felt better, certainly looked better, and was chagrined to admit to herself how badly she'd needed a good cry. The rest of her afternoon with Martha was spent pleasantly. Martha's hobby was baking from scratch and Sammi enjoyed helping her conjure up a coffee cake, and later relished the difference between the real thing and the synthesized one as she and Martha consumed the result while looking out the window at the late afternoon autumn.

Ultimately, just before Sammi was to leave, their conversation came back to Sammi's reason for her visit.

"It *is* silly of me to think that being attracted to Bob is some sort of violation of my wedding vows. Maybe I'm just so afraid of feeling for someone and then being . . . damaged again," Sammi said.

"Sammi, you're grieving, you're lonely, you're cut off from your friends. That leaves you with needs that someone has to meet. You might stop having feelings for Bob once your life is back to normal. On the other hand, the notion that Steve would expect the rest of your life to be a celebration of celibate singleness is nonsense. I think all he'd care about is that you found yourself a genuinely good man."

"I'm afraid to be hurt again, Martha."

"Trying to avoid that by hiding yourself in your work and keeping everyone away is its own form of damage, honey. And it isn't living," Martha said.

Sammi got ready to leave and Martha wrapped up the rest of the coffee cake for her to take along. "You might invite Bob over and share this with him," Martha encouraged, handing Sammi the package. "Will you be able to see him again, soon?"

Shazam. Back to reality, Sammi thought sadly. *Where are you, Bob? You and the rest.*

"Yes, soon," Sammi lied.

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X

Bob noticed a brief flash in his peripheral vision, then his radio died. "Uh oh." He was jetting ten meters above the surface, a bagful of Phinons in each hand. Immediately he hit the jets and blasted straight down to the surface, there to take whatever cover he could amongst the lumps and ridges of ice.

After clearing the shaft and arguing with Pops, Bob had mumbled an inept prayer that the old man would somehow be following him soon. But getting back to the ship with the Phinons *was* his first priority, yet carrying two Phinons along with him would tax his jet-maneuvering computer to the limit unless he found a reasonably balanced way to carry them. (Pops' power suit, having been designed to accommodate even unwieldy sorts of weapons platforms, did not have that limitation. Bob swore that he'd upgrade the minute he was back on Luna.)

Unfortunately, he also wanted to be able to keep his weapons at the ready, but after a short period of experimentation, it became clear to the lieutenant that he couldn't have it both ways. Not unless he wanted to walk. He didn't.

He'd had to put down right outside the shaft opening and minutes had elapsed before Bob actually took hold of the handles again, one in each hand, and holding the rescue bags extended, jumped off the surface and headed toward the *Hyperlight*. He'd had to go gently to avoid tumbling, and had made it about a third of the way back to where the ship lay grounded, listening to Pops and Rick commenting about how the ranks of Phinons were thinning, when his radio died.

On the way down Bob let go of the bags. They'd likely bounce a bit but would pretty much stay where they fell despite the trivial surface gravity. He had a weapon out of its holder and in hand by the time his feet hit the ground and his gripfields held him fast.

Bob didn't know what had taken out his radio. He called up his suit diagnostics and queried, and was shown a readout indicating that the radio node on his right shoulder had reached a peak temperature of 2043 Kelvins, but had rapidly cooled to nondangerous levels.

"Rick? Pops?" he called and silence came back. "Dammit. One of those bastards must have nicked me." Nicked was right—a straight-on shot from a Phinon X-ray laser would have flash vaporized Bob's suit material and the resulting explosion would have been the equivalent of having a grenade go off one millimeter away.

Bob had come down into a notch where two thin ridges about three meters high intersected. He had a clear view of the terrain in the direction of the ship, but there could be any number of Phinons on the other side of the ridges by now.

A full minute passed and nothing happened.

Since he wasn't about to try flying to the ship again, Bob collected up the two Phinons, but this time holding both handles in his left hand. He began the trek back to the ship. After four steps he turned around to see if anyone was back there.

Five Phinon faces were looking at him.

The aliens were hovering just above the ridges, and all had weapons pointed at him. Bob felt two conflicting instincts; one to start shooting and the other to hold the rescue bags in front of him like a shield. The latter impulse, with a push from intuition, won out.

Unbelievably long, uneventful, seconds passed.

They don't know what the hell to do, Bob thought. They can see that I have two of them, but they don't know why, or what it means. Judas Priest! They don't look angry or mad. They just look confused. Still, Bob was certain that they'd figure out what to do if he started shooting. Or walking again.

Then like a single unit, the Phinons slowly descended to the surface. They maintained their confused stares at Bob, and after they were all down, they just stood there, watching, as the lieutenant remained immobile.

Shit, shit, shit! Now what? Throw my captives at them and bolt? They'll cut me to shreds the second I'm clear of the bodies. And I can't get all five of them with my gun. I don't even have a Goddamn grenade on me! I gave them all to Pops.

Without warning, the ground hit him on the feet like an enormous hammer and threw Bob and the Phinons right off the surface and into space, and he was briefly blinded by the flare of the blast from the detonation of Pops' suit. He was tumbling, and he could feel the gentle, sequential bursts from the jets as his suit, having sensed its situation, was trying to bring him into a stable orientation. It seemed to be taking an unusually long time. Bob was still holding on to the Phinons. He put his gun away and blindly shifted one of the aliens to his right hand. He was stable again within seconds, and abruptly his suit vision returned.

It was an awesome scene. The randomly chosen orientation the suit had stopped him in placed him with the mass of the comet looming on his left, and less than a hundred meters away, the still brightly luminous shaft of incandescent gas pouring out of the hole where, Bob now knew, Pops had died. Everywhere partial, glowing Phinons were scattering into the velvet abyss, and after a few seconds of observation Bob noted that he was also a part of this scattering, his proper motion having in only seconds separated him more than two hundred additional meters from the surface of the icy world. Looking more carefully, Bob saw that some of the Phinons around him were still whole, noticed that maneuvering jets were flaring from their suits, and realized that these were the same ones who had

intercepted him on the way back to the ship.

As the only human out there, Bob was sure they'd notice him soon.

Bob scanned the sky around him and it took only moments to locate all five of the Phinons who had been thrown off the comet with him, for all had to employ suit jets to orient themselves, and the tiny flares were easy to differentiate from the pinpoint stars despite some of them being over a kilometer away by now.

"Where the hell is the ship!" Bob shouted into the hollow of his helmet. Without his communications, he had no idea what had happened to Rick and the *Hyperlight*. Had she been shaken off the surface, too? Her gripfields were much stronger than those in Bob's suit. On the other hand, staying on the surface might have been more damaging to the ship than being tossed off. "Where are you, Rick?" He searched the surface of the comet, but by now the explosion had played out and Bob found he had no idea of where to look for the ship.

He gave up the search for a second and looked once again for the Phinons. Now he could see that all had suit jets flaring, and that they were all coming toward him. And worse, even more were now pouring up into the sky from other tunnels from other areas on the surface.

Suddenly the head of one of the Phinons of the gang of five exploded, and its remains vectored off towards Bob's feet. Bob smiled. He recognized the signature of an anti-personnel laser set on full.

He looked, with respect to his orientation, up, and there above him was the (glorious!) silhouette of the *Hyperlight*, APL cluster fully extended, and the airlock door open, waiting for him. Again the APL erupted, and Bob turned in time to see another Phinon die.

And also in time to see two Phinon fighters rise into space from beyond the curve of the comet.

Bob hit his jets, blasting at full, aiming for the airlock.

* * *

Rick Vander Kam was *not* having a good time. Left alone in the ship, there was nothing he could do to help his friends and was forced to simply monitor and record what Pops and Bob were doing. He found that trying to pay attention to both sets of action since they split up was extremely difficult.

Although at first monitoring the views coming from both men, since Bob's return initially consisted of nothing but images of the shaft, Rick was able to focus on the fight Pops was having. Once Bob got to the door, Rick again tried to pay equal attention to both. Rick listened to the exchanges between the two men but decided not to interrupt, even after Bob had blown the door but seemed ready to drop into the shaft to help Pops.

When Bob finally jetted off the surface after tangling with the two Phinon-filled rescue bags, Rick again focused on the battle within the comet, and offered encouragement when he saw that Pops was close to killing all comers.

He wasn't paying attention when Bob's return went dead, and only turned in time to watch the screen flicker once and go black.

"Oh, shit. What happened to Bob?" Rick muttered. Immediately Rick set up a replay of the last few seconds of signal from Bob and called up a telemetry analysis program. One of the rules learned early in the days of space exploration was "Never turn off the radio!" How a signal dies can tell one a lot about what happened to the transmitter. Rick reached the instant of failure and the analysis routines expanded the signal trace, showing a maze of squiggly lines on the screen that all suddenly went flat. That was actually the best news that Rick could have hoped for. It meant that the problem probably originated with the transmitter. Otherwise, telemetry signals from other parts of Bob's suit would have shown distortions just before the transmitter failure.

While concentrating on the loss of signal from Bob's suit, Rick still was listening with a fraction of his attention to the audio coming back from Pops. He heard Pops say: "Aw shit. Bob, where are you?"

Rick knew he'd never forget his last few words with Pops, nor the sick feeling he'd had inside when he saw the descending cloud of Phinons that Pops was looking at, and knew what the old commander was about to do.

The explosion still surprised him.

A thousand things went through Rick's mind all at once, but the most important was the intuitional technical sidebar relating the explosive force of a suit self-destruct to the probable magnitude of cometary surface movement at the radial distance of the *Hyperlight* from ground zero. Instantly Rick was out of his seat and into the pilot's, with one hand motion killing the gripfields and activating the *Hyperlight's* repulsors.

The ship bounced off the surface simultaneously with the glare from the suit explosion suddenly illuminating the control bubble. Rick glanced back to his monitoring station. All the screens were blank.

There was no reason to examine the LOS trace from Pops' suit.

Rick stayed in the bubble and started searching for Bob. He had all of the scanners going and had redirected the visuals from the APL system to the nav screen because it allowed for better magnification.

There was so much to search, Rick found, as he watched the scattering Phinon bodies. With a few adjustments Rick was able to focus only on bodies that seemed to be keeping station and a fixed

orientation. He expected to find one—or none, if Bob was dead. He found six.

A soft chime sounded calling Rick's attention to the Dykdar scanners. "Rats," was all Rick could say as the display indicated that two Phinon ships were on their way out of the comet.

Okay, how much time before those ships arrive? Not much. Let's see if I can find Bob. Not that one. Another Phinon. Phinon. Phinon. There he is! Thank God he's alive! Damn, he's not looking toward the ship—probably doesn't know I'm above him. Those Phinons are after him. Rick hit the switch that opened up the exterior airlock door. *I'll kill the Phinons, Bob. You just get your ass up here.* The APL fired. Rick watched the Phinon die.

Bob watched, too. Rick could actually see the lieutenant look in his direction, and silently rejoiced when his jets fired even as the APL killed another alien. Then Rick saw the Phinon ships, too. *This is going to be close!*

Rick burst out of the control bubble to wait for Bob at the airlock. The wait was interminable even though he could calculate the number of seconds that must elapse before Bob would hit the lock.

Five, four, three, two— CLANG. You're early, Bob. Rick hit the switch to close the lock, saving Bob the precious seconds to do so himself, then activated the slam repressurization and the lock came up to full atmosphere in two seconds.

The inner lock door opened and Bob thrust out the Phinons to Rick. "Throw these in the stateroom," he ordered.

"Two ships are coming," Rick said.

"Saw 'em," Bob replied. His suit split like a clamshell and Bob was on his way to the pilot's bubble before its pieces hit the floor.

Rick hauled the two Phinons to the aft stateroom and threw one on each bunk. *What would Pops think?* Rick wondered. This had been his room. For an instant Rick wondered if he should jolt the Phinons with another dose of Sammi's drug. He looked at his watch and was shocked to realize that less than twenty minutes had elapsed since Bob had first knocked them out. He left them in the rescue bags for now—that was the safest place for them.

Rick went forward and dropped into the copilot's seat. He noticed that the shields were up but the ship was still near the comet. "I'm keeping the comet between us and the Phinon ships until I have our vector for home laid in," Bob said, not looking up from what he was doing.

Rick monitored all of the scanners. With the Dykdar he could see the trace of the Phinon ships. They'd split up and were suddenly coming at them from opposite directions from around the comet.

"Okay, got it," Bob said. "Time to fight or time to run or some reasonable combination thereof." The *Hyperlight* accelerated away from the comet and the Phinon ships were instantly after them.

The Phinons fired missiles, wicked little darts moving out at incredible accelerations. Bob avoided two of them easily, but a third hit the shields. "No sweat," Rick said, watching the indicators. "We took that one okay."

"Great. We'll be in hyperspace in thirty seconds," Bob said. "Just hold them off."

Rick trained the *Hyperlight's* weapons on the marginally closer of the two Phinon ships. He fired the laser and two "smart rocks," kinetic kill vehicles driven by small sequential matter-antimatter explosions. The first smart rock overloaded the Phinon's shields and it collapsed to nothing but a smile of satisfaction on Rick's face.

There was a bright flash through the bubble, like a flare igniting. The *Hyperlight* shuddered, then settled down. "God dammit! What was that?" Bob yelled.

"X-ray laser. Power density way, way, up there! Holy shit!" Rick said.

"Yeah. Holy shit and the drive is gone," Bob replied.

Rick was already checking the diagnostics. "We had a squib burn-through of the shields. Right above the port hyperdrive nacelle. That one's wrecked."

"Gonna be a long walk home," Bob said.

"Hell no!" Rick shouted, but he was looking at the weapons display. He'd sent the remaining complement of smart rocks at the Phinon fighter.

It did the trick.

"Hell, no!" Rick said again, springing up from the chair. "The sublight drive is gone, Bob. But we only need one nacelle for hyperdrive. Just give me a half hour in the engine compartment."

Rick grabbed his tools and diagnostics equipment from the locker and was soon sprawled on the aft deck, working like a maniac.

"Bad news," Bob said over the comm a short time later. "The Dykdar shows a couple more ships on their way. I'm going to run up the reaction drive. Might as well buy what time we can."

Lying on the deck, Rick could feel the rumble as the reaction drive flared to life, but it was the last thing he noticed outside himself and the hyperdrive motor.

The *Hyperlight* only needed one unit, but the remaining one had been balanced to work with another, and the adjustments necessary to get it to function by itself were many and complicated. Still, Rick rose to the occasion and in exactly 29 minutes turned over and shouted, "Hyperdrive, now!"

And they were on their way back home.

* * *

Bob lost track of how long he had been staring out the window at the monochrome phantasmagoria of hyperspace. Lacking anything else to do after getting the drive online, Rick had gone off to take a shower ten, twenty—maybe sixty minutes ago. Bob didn't know.

He kept part of his attention on the scanners, and no Phinons had followed them into hyperspace. That was good.

Still, it didn't change the fact that he'd lost a man.

Rick finally came forward and slumped into the copilot's chair. His hair was still wet. *Ah, ten minutes ago*, Bob thought.

"I guess I should thank you for saving my life," Bob said.

"Saved mine, too. But you're welcome. To repay me you can pilot us back home."

"The best I can do is the Solar System," Bob answered. "We have almost no reaction mass left. Our velocity relative to the Sun once we drop out of drive is going to be around eight hundred kps. But we're going to have to drop out early because I don't want to get too close to the Hague Limit. I still remember that artwork Pops showed us of a hyperdrive motor hitting it while activated."

"What artwork?"

"Oh. Sorry. I forgot. You were dancing with Paula when he showed me. Anyway, thirty-five hours from now we're dropping out and then we'll just coast through the Solar System. But shit, it's going to take us over forty days just to get to the orbit of Pluto, and we're not going to get any farther in than the orbit of Uranus."

"Space is big," Rick said. "Damn."

Bob ran his hand through his hair, then put his hands behind his head and leaned back. He sighed. "Rick, what the hell happened to Pops? Did you see it?"

Perceptively, Rick said, "He didn't have a choice, Bob. And there was nothing we could do." Rick briefly described what he'd seen on the monitors. "I didn't even get a decent chance to say good-bye."

"I owe my life to Pops, too," Bob said. "If he hadn't done what he did, the Phinons would have killed me soon. Some leader I am. First Pops saves my ass, then you save it again, and even after I'm back aboard you have to save it a third time or we'd be toast back there at the comet."

"You're forgetting what's in the back stateroom," Rick said. "You brought the live Phinons back to the ship. That's what's important. That's what Chris sent us out here to do. Pops knew what price might have to be paid. So did my dad. So did you."

"Dammit, I know that!" Bob said. "It just doesn't *feel* that simple."

After that there wasn't much to say—or do, except to wait until breakout. Bob took his own shower, then returned to the control bubble and refined his estimates for breakout time, and calculated just how close to the inner system he'd be able to bring his crippled ship.

Of course, once they left hyperdrive, they could always radio for help, but that would mean the Belt would find out about them. And the hyperdrive.

Rick came forward again. "I was just checking on the aliens. I took them out of the bags. They're not stirring yet, but I don't know what the hell we're going to do with them the whole time we're coasting back into the system. I don't think we have enough ampoules to keep them sedated that long, and even if we did it would probably kill them, I'd think."

"Yeah. I think we're going to have to send out an SOS, but I'd rather the Belt didn't find us first."

"We're coming back awfully late, anyway," Rick said. "Maybe Chris will have the Patrol monitoring deep space for us continuously."

"Good point," Bob said. "Only I think it will be Knoedler who will be looking for us."

"I don't suppose it matters. The jig is up once we show up with the Phinons anyway. I just hope Sammi can actually perfect her bugs once she has those guys."

Bob was looking at Rick when he mentioned Sammi, but this time he thought he detected a change in Rick from how he usually talked whenever her name came up. He decided to keep the topic going.

"I'm sure she will," Bob said. "She's an awfully smart girl. A genius. That intimidates the hell out of me. Of course, so do you on that score, Rick. You can keep up with her."

"Somehow I don't think IQ is the first thing on Samantha's list when she thinks about men. I've never found that to be true of any other women," Rick said. "Hell, it's not true of *me* when I think about women," he added with a grin.

"You don't think she finds your intelligence attractive?" Bob asked, continuing the subtle inquisition.

"Attractive? Certainly. But not sufficient. And quit trying to be sneaky. You're no good at it. You know I like her, and I know you like her. But one thing I know that you don't is that she likes you, too."

"What? Bullshit," Bob said. He'd lost control of this conversation.

"No, it's not bullshit. Once the sorrow is gone, she'll admit that you get her all steamy. You think that you're the first uniformed stud that a technogeek like me has lost out to? Buddy, I *know* the signs."

"Okay, then, what's Paula's angle?" Bob asked. "She didn't even *see* me when we were introduced."

"My family has a lot of money," Rick reminded him.

"So you're saying she's just a gold-digging bitch?"

"Don't call her that!" Rick said, suddenly angry.

"Aha!" Bob replied, but then Rick stomped out.

* * *

Rick finished administering another dose of PMDP to each of the Phinons. Although he recalled that the dosages he was giving would have kept a bull elephant under for three days, he'd found it necessary to sock the aliens with another dose every twelve hours or they began to show evidence of waking up.

He looked again at the hands, the ones that had been damaged when Pops had pulled them apart. They were getting better. It looked like the Phinons had incredible powers of regeneration. Perhaps that was also why the drug didn't work so well—the alien physiology might simply have regenerated whatever binding sites were deactivated by the PMDP, rather than waiting for the drug to clear out on its own.

Rick found the questions interesting, but not compelling. There were people on the Moon who could answer those questions. What was of much more concern to him was that he and Bob didn't have enough ampoules to keep the Phinons out for the entire duration of their return to Earth-Luna. Or till their

rescue, rather, since no matter what they did, they'd have to call for help.

Bob entered the stateroom. "Same thing?" he asked.

"Yeah. They start stirring after twelve hours. We have enough of the drug to keep them out for a week or so, but after that we'd either better have a cage ready or be rescued," Rick replied.

"It's another consideration," Bob said.

"Look at the hands," Rick said, pointing. "They're growing back. That hand there is the one that was shattered. You'd never know it now."

Bob held up his own hand. "This is the hand I lost when I stole Hague away from the Belt. This one they put on still doesn't feel right."

"Breakout is in a few minutes?" Rick asked, changing the subject.

"Right. That's why I came back here. I want you up front to help me find out exactly where we are ASAP. That will help us narrow down our options."

"Okay."

They went up to the control bubble and took their seats. Only seconds later the *Hyperlight* emerged from hyperspace right on the mark, and the reappearance of the stars out of the monochrome was spectacular.

Really spectacular.

"Those aren't *all* stars," Rick said after a few seconds of staring.

"Damn right they're not," Bob said. "Where in the hell are we? And what do the scanners show?"

What the scanners showed was hundreds of thousands, perhaps millions, of spaceships. What their eyes revealed was the brilliant dazzle of nothing any more exciting than a powerful reaction drive, multiplied thousands of times, scattered as far as the eye could see so it was nearly impossible to separate them from the distant stars.

"Oh my God," the lieutenant said. "The Phinons put reaction drives on their spaceships."

"Which means they want to come inside the Hague Limit. That proves that Chris was right. The Phinons really didn't have a two-element drive," Rick said.

"Look at how many there are," Bob said. "They could be using chemical rockets and it wouldn't make a hell of a lot of difference. Humans haven't built that many spaceships in our entire history."

For the next ten minutes the two shut up and tried to sort out their situation. They had emerged, surprisingly, less than one astronomical unit from the Hague Limit. This drew a sharp look from Rick. "We were less than twenty seconds away from tearing the ship to pieces," he said.

"Sorry," Bob said. "I was shooting for ten seconds, but I wanted to be cautious," he added, although he was even more shocked than Rick that they'd come out so close.

In addition, they'd come out inside a Phinon fleet. Bob determined that the fleet was moving on a vector 22 degrees different from their own, and the average fleet velocity was, at this moment, though the ships were accelerating, about 200 kps relative to the Sun. Surprisingly, the ships didn't seem at all interested in the *Hyperlight*, for none were turning in her direction, nor activating their sublight engines to catch them even though they were still (barely) outside the Limit.

"I've got some spectral data from their drives," Rick said. "Looks like ordinary matter-antimatter stuff within an open Dykstra field bubble, at a fractional percentage ratio. I suppose it could be partial mass conversion instead. It's a little hard to tell but I think the drive in your courier boat is more efficient than these are.

"Have you figured out where these ships are going?"

"Let's have a look," Bob said, and he threw up their position on a screen graphic of the Solar System. "See, we're headed up from Solar south, and so are they. But they're heading in deeper than we are, and—" Bob expanded the scale at the center of the screen. "Oh, shit. Jupiter. They're going to Jupiter."

"Biggest planet first, I guess," Rick said. "There are over four million people in the Jupiter satellite system."

"Won't be long and there won't be any," Bob said. "Not unless we can stop them."

They looked again at the vast array of brilliant pinpoints. By now they were certain that their velocity had taken them outside the confines of the fleet, but that was hardly a comfort.

"Well, skipper?" Rick asked after a moment.

"Let's rig up a power boost for the transmitter, Rick. We have nothing to be coy about anymore. We're going to blanket the entire Solar System with our mayday and SOS, both widespread laser and good old E and M. The Phinon Project is no longer a secret."

"I'll get right on it," Rick said. "I agree, we have to tell everyone. I just hope to hell it will make a

difference."

"Ultimately, it will," Bob said. He looked again at the Phinon fleet. "But not to the people at Jupiter."

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XI

"Colonel, you're going to want to see this immediately," Lieutenant Commander Le said, bursting through the door into his office. Knoedler barely had time to turn around in his chair before she was tapping codes into his keyboard and bringing in the latest (encrypted) information from one of the deep space listening posts.

Knoedler watched in rapt attention. "They're finally back," he said. "And sending an SOS, too. Try to get Dykstra for me, Commander." She returned to her desk. Then he looked at the coordinates of the *Hyperlight*. The ship was in the same direction as the Phinon hyperspace breakout point. He didn't have any time to wonder about that before the visuals of the Phinon fleet came through.

Shit! Shit! Shit! "Nikki!" he shouted, forgetting to call her by her rank and not even noticing.

"I have Dykstra," she said. "Now what?"

"There should be—"

"Wait!" she cried. "We're getting a data dump from deeptacking. That's what you want, right?"

"Yes. And tell Dykstra to meet us here immediately."

A few minutes later the situation had become clear to the colonel and the commander. "Those are the traces of the alien reaction drives that the distress call talks about," Knoedler said, more to himself than to Nikki since she could see them herself. "So far we've found six hundred thirty-four thousand individual signatures."

"This is scary," Nikki said. "How do you fight that many ships?"

"I don't know," Knoedler said. "I just don't know. But we're going to have to go out there and get the *Hyperlight* ourselves. My ship is the fastest available."

"And I don't suppose you want the Belt getting there first," Nikki added.

"Nope. Have you noticed we haven't heard anything from *them* yet about the distress call? At any rate, it's going to be another late night for us. Better have food sent in, enough for us and Dykstra."

"Your usual, Colonel?" Nikki asked.

"Yes," he said. Then: "Y'know, I'm sorry you haven't had much of a life outside of work lately, Commander."

"Have I complained? Sir."

"You don't need to add the `sir,' " Knoedler said. "I told you that."

"And I have a name besides `Commander,' " Nikki replied. "You used it just a few minutes ago."

"I did?" Knoedler honestly didn't recall. "I've been trying to remain professional," he said.

"What would happen if you stopped trying?"

Those words set off a train of erotic images that Knoedler had been incorporating into some very recent fantasies, but he was too controlled to show it. "Do you want me to tell you, Nikki?"

The door chime sounded and the autoannouncer intoned, "Dr. Dykstra is waiting." Knoedler frowned.

"I want you to *show* me, Tommy . . . sir," Nikki said, and with a sly smile went to answer the door.

* * *

"Wow. Less than two-and-a-half hours. That was fast," Bob said when Rick informed him that their distress call had already been answered. The lieutenant had been taking a much needed nap. "Yeah. Some Belt ship called the *Queen Lucy*. They say they're on a scientific mission to some rocks out near the Kuiper Belt. You buy that?"

"Hell no."

"They didn't say much else," Rick continued. "They gave their position and an ETA, but didn't mention anything about the Phinon fleet."

"Maybe they think we're space happy," Bob said, not seriously. "We didn't exactly come clean on everything either. What do you suppose they'll say once they find the Phinons in the stateroom?"

Five days went by. Bob and Rick continued to exchange brief messages with the *Queen Lucy*, but the lightspeed delay was annoying and made regular conversation impossible, and besides that, their rescuers seemed to be playing their cards close to the vest. The Phinons were still sleeping, but with each day the PMDP dosage had to be administered fifteen minutes earlier, so by now the aliens were getting shots less than eleven hours apart. Bob and Rick took turns feeding nutrient solution to their captives. The solution had been concocted based on an examination of the stomach contents of Phinons

killed at Slingshot. They just inserted a tube into the mouth orifice on the "head" and poured in a liter each time. The aliens didn't seem to be losing weight.

Strangely, the *Hyperlight* had yet to receive a transmission from the System Patrol. This was something that Bob could not understand since there had been plenty of time for their signal to reach the inner system and for a reply to have come back, even if their superiors had wanted to think about what to say for a few days.

Finally Rick saw the drive flame of the *Queen Lucy* as it was slowing down to match velocities with them. "Our rescuer is a luxury liner," Rick said. "But it has a battleship's engine. This ship belongs to the Belt Defense Force. I'm sure of it."

"Okay, so it has the legs of a warship. Does it have the arms?"

"No way to tell, Bob. Sorry."

"No wonder they didn't want to talk about themselves," Bob said. "'Course, I'm kind of stuck now. We committed treason when we took the ship out into the Oort cloud. We'll be doing it again if we let the Belt have this ship instead of blowing it up. This is becoming a habit."

"We could defect," Rick said. "I hear the weather is nice on Ceres."

The other ship matched velocities. Bob was impressed by the skill of the ship's pilot. He brought the *Queen Lucy* right alongside the *Hyperlight* on the first pass and into the groove so tight that relative drift velocities could be measured in centimeters per minute.

"They're hailing us," Rick said, and he put the voice on the loudspeaker.

"This is Captain Brinn of the *Queen Lucy*. Please roll your ship fourteen degrees so we may extend our docking tube to lock onto your door."

"Not so fast, Captain," Bob said "We know you're BDF. We want to talk a minute."

"Okay, this is Captain Brinn of the *BDF*. Do you guys freaking want to be rescued or not?"

I like this man, Bob thought. "We're not breathing our last wisps of air yet, Captain. We're just out of reaction mass. But this little ship can still blow your ass out of the sky and I'm willing to wait for a more polite BDF officer to come along," the lieutenant said.

There was a pause; then the reply came back: "I suppose the proper response to that is `Oh yeah!' or `Sez you!' but I think I'd rather just talk. What do you want to know?"

"What were you really doing way the hell out here?" Bob asked.

"As you no doubt know, Glacierville was hit by an alien raid. We were coming out here to see what else we could discover. Our mission is—or rather, was—as secret as yours."

"I doubt that," Rick said softly enough so that the comm pickup would miss it.

Bob and Brinn continued to sound each other out, and finally Bob, as a form of confession, asked the most important question: "Do you have a supply of PMDP on board, and how long would it take you to get us back to the inner system? And if you don't have any PMDP, do you have a really strong room with a good lock on the door?"

There was a long pause, then Brinn said: "You have alien POWs along, don't you, Lieutenant?"

"You're quick, Captain. I like that," Bob said. "That's what we went out there for."

Bob felt a tug on his sleeve. Rick was trying to get his attention—was pointing to the scanner display. Bob looked more closely, frowned, then looked at Rick who just shrugged. "Who?" Bob whispered.

"Don't know," Rick whispered back. "But they have Dykstra-Hague impellers and they're slowing down at a hundred gees. They'll be here in less than an hour. I'll listen for a hail."

"Where were we, Captain Brinn?" Bob said, but he was met with silence.

"They stopped transmitting," Rick said. "Guess they've seen that incoming boat, too."

Bob and Rick did not have to wait long before the approaching ship called. "Welcome back, gentlemen. This is Colonel Knoedler of System Patrol Intelligence. We've been expecting you . . . for quite some time. Dr. Dykstra has a question he wanted me to ask. `Did you get the present you were shopping for?'"

Rick and Bob looked at each other, then almost sadly, which was even a surprise to him, Bob replied, "I guess it's time we passed the fate of the Universe on to you. Yes, Colonel, we found it, and now it's Christmas morning."

* * *

Bob had to admit that the guys from the Belt had picked a comfortable means of travel. A luxury liner filled with scientific gear. What a great idea. The opulent meeting room that he, Rick, and the others were now gathered in was not only gorgeous, but comfortable. He leaned back in the nicely cushioned chair and continued to listen to Colonel Knoedler.

Knoedler had been telling them about the current state of affairs between the Belt and the Solar Union. The discovery of the Phinon fleet heading inside the Hague Limit had turned the cease-fire into peace, and now scientists from the Phinon Project and the Capitol Products docks were already on the way to the Belt to explain the new technology.

Of course, it hadn't hurt to have people like Knoedler behind the scenes pulling strings.

Rick was seated to Bob's immediate right, and then around beyond him sat Captain Brinn, the colonel, the colonel's (beautiful) assistant Lieutenant Commander Le, and a Belt general whose name Bob had failed to catch immediately to his left. It had been clear from the outset, despite having a Belt general along, that this meeting out here in deep space was Colonel Knoedler's show.

"Okay, that's the background," Knoedler continued. "We took an extra day outfitting my boat to hold the captured aliens, assuming there were any, and then it ate up some time when Commander Le and I had to stop on Ceres to pick up General Adams," *ah, Adams*, Bob thought, "but we couldn't avoid that since the *Queen Lucy* is a Belt ship.

"Which brings us to now. Lieutenant Nachtgall and Dr. Vander Kam will be returning on my ship to the Moon, as will our captives."

"But what about the *Hyperlight*, Colonel?" Bob asked. "We can't just leave her out here."

"And why not, Lieutenant? Let me be blunt about this. We need those Phinons on Luna. Everything else I could leave out here, myself included, just as long as we get the Phinons back to the High Command. Maybe some day someone will come out here and salvage the *Hyperlight* for a museum, but her race is run.

"As for the *Queen Lucy*, General Adams will be remaining on her with you, Captain Brinn. Given the equipment aboard her, she's needed out here to monitor the Phinon fleet.

"We leave immediately after the Phinons are transferred. By your leave, General?" Adams nodded. "Dismissed."

And that's that, Bob thought as he returned to the *Hyperlight* with Rick. Rick didn't have anything to say, so with a minimum of verbal exchanges they put the Phinons in rescue bags again for transport and carried them to the main lock. Others from the *Queen Lucy* took the aliens from there, and Bob and Rick went to gather up the boxes containing the dead Phinons and the implements they'd collected on their trip. Once those were transferred, they both stood for a moment at the lock.

"I can't find any appropriate words," Rick finally said. "The most important months of my life were spent with this ship."

"Mine too," Bob said. "I promise, once the war is over, you and I will come out here and bring her back home. We can plot her trajectory for the next million years, so I don't think we'll have trouble finding her."

With that, they left, and a few minutes later Bob watched from the window of Knoedler's boat as the *Queen Lucy* severed her connection to the *Hyperlight*. Then it was their turn, and Nikki Le separated her craft from the luxury liner, rotated, then threw the drive to full.

At over 100 gees, the *Queen Lucy* and the *Hyperlight* disappeared in their wake in a frustratingly short instant.

Even for someone who doesn't like long good-byes, Bob thought.

* * *

I don't think I've run like this in the last thirty years, Dykstra thought as he hurried down the corridor to Sammi's lab. The message from Colonel Knoedler that he was on the way back with the crew of the *Hyperlight* had come only minutes before, and he was anxious to tell Sammi right away. He had agreed to the colonel's request (not order) to not tell the woman about the reception of the distress call when it had come days before, and now he was eager to make up for keeping her in the dark about the fate of her friends.

And he couldn't just call, not when he'd have to tell her that one of the men hadn't returned.

Dykstra turned a corner, almost tripped, had to catch himself with a hand to the wall. *How could I have forgotten my cane?* He caught his breath a moment, winced as he set off again. *Extra aches and pains for at least a week,* he thought.

Finally he was at her lab, but he was almost out of breath. *I won't even be able to talk to her until I catch my breath.* He found himself staggering through the door, saw her hair as she turned in his direction, but she seemed to be seated in a fog. "Sammi . . ." he said, but then thrust his palm against the wall in a desperate attempt to hold himself up, and still found himself sinking to the floor. Out of the fog he saw Sammi rushing to him, her chair toppled over in her haste to reach him.

"Chris! Chris! Medical team, stat!" he heard, but it came from a far distant place.

And then all was crystal clear, and James Christian Dykstra found himself in a tunnel, with a bright light at the end, and he was moving toward it.

A near death experience. At least I hope it's just "near." His mind felt incredibly sharp, and he couldn't help but examine the walls of the tunnel and attempt to discern their composition, but he was moving too fast. So he examined the nature of his motion, duly noted the absence of inertial effects and the lack of

wind, then patiently awaited his arrival at the light source.

Presently he found himself standing on some sort of open plain, and there were human figures in front of him, but they were backlit and the white light was too intense for him to be able to make out any of their faces.

Except for one, and she came forward to greet him.

"Hello, Jenny," he said.

Oh, the beauty she had at twenty, yet the nobility she'd acquired by sixty, he thought.

"Welcome, Chris. But you are not staying. There is still a little bit for you to accomplish," she said.

There was so much he wanted to say to her, even if this was only some kind of dream or his brain discharging chemicals in death. But what he did finally say was: "Why can't I see the others behind you?"

Jenny sighed. *People sigh in heaven?* "Always the scientist, aren't you? Do you think *He* doesn't understand your abilities? You have just come, but now it is already time for you to go." This time he *did* feel a wind, but it was blowing him back.

"Then why did I have to come at all?"

"You will know," Jenny said, and she smiled, a smile much like Sunshine's.

"Is Jamie here?" he called out even as he found himself falling away.

She just smiled at him as if amused by the question, and her smile faded into the distance as he found himself back in the tunnel, tumbling, and his chest hurt.

Dykstra awoke with a start, felt the tubes in his chest jerk, and realized he was in the High Command hospital. Almost immediately a doctor entered. "I'm Dr. Claire. How are you feeling, Dr. Dykstra?" she asked.

"Like I'm a hundred and twenty-six years old," he rasped out. "But then, I *am*."

"Well your heart isn't. Not anymore. We had to put in a mechanical unit. That was on orders from the top. They want the available medical telemetry. You're just too valuable to lose. Besides, at your age, regenerating your old one wouldn't have been a good idea anyway." She looked over the readouts on his med scanner. "You're looking good. But I want to keep you here for a few days, maybe even a week—"

"I don't have a week—"

"You most certainly do," she shot back sternly, and that was the end of his protest. "You also have a visitor. No more than a half hour, though. After that you're going to sleep again for a while." At that Dr. Claire left, passing Sammi who was on her way in.

"Chris! Thank God you're going to be all right. I was so terrified we had lost you."

For a moment Chris thought he saw the heavenly image of Jenny superimposed over Sammi, and he smiled. He decided not to mention his "trip" to her. Still, it had been nice to see Jenny again. "I can't leave until my work is done. Maybe when I'm two hundred or so."

"You were coming to tell me that the guys are on their way back, weren't you? You've been out for twenty-four hours. I know about that now. Why didn't you just call?" she asked.

"Did you find out that Pops isn't with them?" Dykstra had told Sammi the identity of the third crew member as soon as the *Hyperlight* was safely on her way. He could tell from her response that she had not heard the news. "That's why," he said.

Tears welled in her eyes, but she didn't start to cry. Finally she said, "He's with Steve now. I'm sure they have a lot to talk about."

"There are two Phinons coming back, too," Dykstra told her. "I'm sure you didn't hear about that, either. But the men were successful. Now it's up to you."

"You mean `us,' " Sammi said automatically.

"No. You."

"I don't understand."

"There's a Phinon fleet coming in, Samantha. They've converted their ships to reaction drives so they can get around inside the Hague Limit. But there are hundreds of thousands, perhaps millions, of ships on their way. Right now they're all heading towards Jupiter, but it would be stupid to assume that they won't get to the rest of the Solar System in due time."

"*Millions* of ships? My God," she said. "You're not kidding."

"We can't fight that many ships, Sammi. To his credit, Colonel Knoedler apologized profusely for doubting me, and then thanked me for committing treason, because we needed those Phinons. Genano infection is the only idea we have right now that might ultimately be able to defeat them."

"But . . . um . . . I don't know what to say."

"You're allowed to feel overwhelmed," Dykstra said. "I do myself. And there's more. In the last few days, every human outpost, Union or Belt, out beyond the Hague Limit has been attacked by the Phinons. At least by now most of ours have been on the lookout, so it hasn't been the kind of rout that we took at Slingshot. The Phinons have only been attacking with a few ships at a time. Still, the High Command has ordered a full-scale fall back into the Hague volume, and every single pilot in the Solar System who has ever flown a military ship is on his way to either the Moon or Ceres. For what it's worth, we're putting together an armada of our own to see what they can do against that fleet. Since the Phinons are limited to reaction drives now at least we're not totally outclassed."

Dykstra wasn't sure about how much Sammi was actually listening to him. In fact, he wouldn't have been surprised if she'd missed most of what he was saying, and instead had only thoughts of "It's all up to me" running through her brain.

"At any rate, Rick and Bob should be back the day after tomorrow. I guess you'd better get whatever series of experiments that you need to perform in line. We're not going to want to wait any longer than we have to for the results."

"I'll, um, get right on it," Sammi said, then drifted away, not even remembering to utter the customary "get well soon" remarks one makes when leaving a sick friend.

Dykstra didn't notice the omission anyway.

Alone now, he glanced around his room, noted the monitoring instrumentation, watched the line on the screen that told him how optimally his new heart was operating. But these were just peripheral images to occupy his eyes while his mind continued to work.

He was somewhat ashamed of the minimal amount of work he'd been able to accomplish since returning to the Moon after the *Hyperlight's* departure, but there'd been all that political rigmarole to deal with, what with the situation with the Belt. At least that was over for now. In an ironic way, it was fortunate for the human family that they'd once again been fighting with each other—their industries were already on a war footing—when the Phinons had come.

We'll have ships rolling off the lines continuously, he thought. And these will have the new drive. Come to think of it, by now we could have lots of ships equipped with it, and should have. I'd better ask Knoedler about that. Apart from the Hyperlight and his boat, I can think of only nine others that are out there. We should have more. Ergo, we do. The Colonel has something up his sleeve. He would have had to keep it hidden from the Belt to keep his own superiors happy. And secret from me, too.

Dykstra thought about the Phinon ships. Reaction drives using partial mass conversion. And out of the

million or so in the fleet, only two kinds of ships had been found—the "big" ones, the kind that hit Slingshot and seemed to hold a crew of eight, and the "little" ones like the one that Michaels met up with on OEV 1. He envisioned his penultimate worst scenario (the worst was simple annihilation of humanity). The Phinons would hit the environs around Jupiter, then come through again and hit each of the planets and concentrations of civilization in turn. Humans would be forced to hide out: among the rocks of the Belt, buried deep under the surfaces of the planets, perhaps at the bottoms of the oceans. *The Phinons have been out in cometary space so long, they might not even remember what an ocean is. Then again, I don't think remembering has anything to do with it. But as long as some technical part of society could hold out, eventually we'd get them through genano diseases attacking their bodies or nanotech killbots attacking their machines.* To date, there was no evidence whatsoever that the Phinons had nanoscale technology. *For of one thing I am certain. The Phinons cannot match us in innovation. Their intelligence is not like ours. Their use of reaction drives for this fleet is all the proof I need of that.*

But it would be a shame if it went that far. Much better it would be to defeat the Phinons early. And that thought led the preeminent genius of the 21st century to unlock those doors in his mind behind which he had hidden the ideas for the most potentially frightening weaponry conceived by anyone. Ever. James Christian Dykstra had given the human race technological miracles that had unlocked the Solar System. Along the way he had deliberately not delved into every possible aspect of those technologies, had deliberately not proven to himself that some of the weapons of which he could conceive he could ultimately build. Let the blood be on someone else's hands.

But now was the time to reconsider.

He hadn't had much time to think about it when the doctor had him put under again, and shortly after he awoke the next morning he was told that he had visitors and asked if he wanted to see them.

"Of course I want to see them!" he said, annoyed at the nursebot for even thinking it was an open question.

Within minutes Sammi, Hague, and three squirrels entered.

The squirrels were not roaming free. At least, not on the floor. On Hague, now that was a different matter. The little man was wearing what looked like a heavy leather work coat, and around this, as if they were playing on the trunk of a tree, scampered the squirrels.

"Hello, Chris," Sammi said. "Dr. Hague wanted to come and bring his . . . friends. He was quite adamant about it, too."

"Oh, yes, Dr. Dykstra. Yes. My friends wanted to come, too. Oh yes. Yes. You are feeling well, yes?"

"I'm improving, Arie. Thank you. I'll be out in another few days and I'll be able to visit you and the squirrels in the lab again." It had essentially been a daily thing for Dykstra in the past few weeks to pay

Arie and his pets a visit. The diminutive scientist had a way of cheering him up, and the chatter of the squirrels reminded him of his home in the mountains—in the days before the war, that is.

"Good. Oh good. They missed you, yes, yes, Dr. Dykstra. They missed you. Sarobi the most, oh yes, oh yes. But also the others. Yes." One squirrel suddenly perched on Hague's shoulder and started to chatter. It was, in fact, Sarobi, which Dykstra could tell now that she'd stopped racing around. Hague seemed to wait until the squirrel was finished then said, "She is expressing delight. Oh yes. Yes. She is happy to see you. Poor squirrels. Small brains, oh yes. No storage space for words. No."

"Tell her I'm happy to see her, too," Dykstra said, and Hague commenced to chatter and squeal, as if a fourth squirrel had joined the other three.

Sammi was smiling at all this. "I have a hard copy of Arie's paper on squirrel communications," she said. She handed Dykstra a sheaf of pages. "He wrote it himself, then the computer edited it. This is actually a download of the published version from the *Journal of Mammalian Science*. The editor was quite impressed." In just a few months Hague had learned more about squirrel "society" than had ever even been suspected.

Hague seemed to be involved in a "conversation" with Sarobi. Dykstra said, "Here we are worrying about the future of humanity, and Arie finds time to see what the squirrels are up to. Maybe that will ultimately prove to be more important."

* * *

Bob will be back in a few minutes, Sammi was thinking. *Then what?* She was down at the High Command docks, waiting near the berth where Knoedler's ship would soon be. The ship was only a few minutes out. There were plenty of other people around, technicians she'd never met, a few other scientists from the biology section that she did recognize, assorted brass. The technicians were all clustered around a high-tech cage, the temporary future home of the two Phinon prisoners. *No—specimens*, Sammi thought with satisfaction.

Dykstra was also there, waiting nearby, this time with his cane firmly in hand as he leaned against the wall. They'd brought a chair for him, but he was stubbornly refusing to use it. He looked drawn and tired. At least he was out of the hospital. For now. *That's the problem. Chris has been scared. We need him so badly, and he knows it, too. He doesn't want to die on us. But I bet he isn't afraid of death—he's just afraid of letting us all down.*

Present also was Hague, although the squirrels didn't make the trip. Sammi was unsure of what Hague had been told about Knoedler's return. He was clearly excited that Rick would soon be back, but she didn't know if he'd been told about the Phinons. Hague would go absolutely berserk when in the presence of Phinon technology—there was a wrongness to it that the savant just couldn't handle. What would he do when he saw a member of the species that created that technology? That was a question that

also concerned the System Patrol—Hague was enveloped by two escorts, no doubt with sedatives at the ready.

And how would *she* feel when she saw a living member of the species that killed her husband?
Specimens, dammit! Specimens.

A klaxon sounded and Sammi turned to look out through the airdam into the sky beyond. Knoedler's ship was in view now, coming in smoothly, and then with silent grace it slipped through the dam and settled gently into its slot. Within moments the side door opened, but first the techs entered, emerging a minute later carrying out the still comatose aliens.

They look like lizards made out of pipes, Sammi thought, but her view of them was so short that she didn't even have time to examine her feelings. She glanced over at Hague, but he seemed simply curious. "Ah, the Phinons, the Phinons, the alien breed, oh yes, yes," he was saying.

Then she did have a chance to examine her feelings, though not about the aliens. Bob walked out of the ship accompanied by Lieutenant Commander Nikki Le.

She'd met Nikki once before, but hadn't actually talked to her. She was just the new aide to Colonel Knoedler, and though Sammi noticed the woman's physical attractiveness, she hadn't thought about it much.

But she was thinking about it now.

Why is he walking with her? What were they doing out there? Who does she think she is, anyway? The questions came unbidden and the more rational part of Sammi's mind recognized how silly they were. But there was a hollow developing in her stomach that she couldn't get rid of, and a slow sinking feeling, different in magnitude, but not in kind, from that which she felt when she was notified of Steve's death.

Dammit, pull yourself together! After the send-off you gave him, what did you expect? You don't have any claims on him. Be careful now—here he comes. Bob had spotted her, and with Nikki, was walking over. *Give him a hug . . .* She embraced him. *Good, one second, two, let go.*

"We're all so glad you're back, Bob. But it was sad to hear about Pops," she said as she let the embrace lapse.

"We were successful, Sammi. Wouldn't have been without him, though," Bob said. "Have you met Lieutenant Commander Le?"

"Once before. Hi," Sammi said.

"Hello again," Nikki replied.

"I'm going to go get cleaned up before the debriefing," Bob said. "I'll look you up later, Sammi." And then he was gone. But Sammi was satisfied to note that he went to the right, and Nikki to the left, when they hit the corridor outside the docking bay.

By the time Sammi turned back around, she saw that the others had also left the ship. Knoedler had gone straight to Dykstra, and Rick had gone straight to Hague, and though she could hear only snatches of that conversation, it was clear that Hague was animatedly filling Rick in on the latest research with the squirrels. He would have had to start from the beginning since the squirrels weren't on the Moon when Rick had departed. Then she heard a call of "Rick! Rick!" coming from behind her and she turned to see a gorgeous young woman running in. *And who is this . . . bouncy-wouncy person?*

"Paula?" Rick said. "What are you doing here?"

"The station was evacuated. All the pilots were brought here." She caught up to him then and gave him a decidedly affectionate embrace, then kissed him full on the lips. *Well, I guess I can write him off, too. What the hell was going on out there?* "Oh, I'm so glad to see you." The girl looked around. "But where is Pops?"

Before Rick could tell Paula, Sammi left. That would be reliving too painful a memory for her, seeing someone else being given that kind of bad news. She wondered, however, what Rick would say. But she was certain he would be gentle—she had caught that look in his eye when he'd recognized that it was Paula calling to him. Whatever romantic interest the brilliant EE had ever had in her had since gone on to an obviously more fertile field.

Fortunately for her feelings, the next few days were so filled with work for Sammi that she had little time to think about them. Instead of burying herself in her work, this time she was in danger of having her work bury her.

The Phinons were being held in a cage on the very lowest level of the High Command. It was a special sort of cage, designed with gravity control, the atmosphere "mix" that the men had found in the Phinon comet, and internal ultra-high-fidelity holograms so that it would look to the aliens like they were inside one of their own spaceships. No one expected them to be fooled by this—after all, the food would still be the same all-purpose goop. But at least they would be unable to plot a course of action.

There was a viewing area for people who wanted to watch the aliens. The first day this was occupied at one time or another by everyone working on the Phinon Project. Sammi had gone to look, briefly. The viewing screen was oriented so that it looked like one whole wall of the Phinon cage was missing. But there were too many others there, and the fact was that she had too much work to do. After a couple of days the theater would often stand empty, but Sammi had yet to find time to get down there.

Bob and Rick had returned with riches beyond compare for the biology team of the Project. Just

sampling all of the video data from the trip to get an idea of what was in the cache had taken her a full day. The views of the Phinons mating had been the most popular; you could bet those places on their shoulders would get extra attention once—

Once we kill them, Sammi thought.

One of the other things that Sammi had found especially interesting was that some of the Phinons had fired guns with their "feet." An opinion was emerging that perhaps the Phinons' "head reversal" was equivalent to human right- or left-handedness. Andy held this view. Since both of the Phinon prisoners were "top-headed," further examination of the physiological difference between the two types would have to wait.

Of more importance to her was the nature of the Phinon regenerative capabilities. With a nasty grin she had been working on understanding how that system must perform. She was certain that she could turn it to the advantage of her genanites.

She'd had no chance to talk with Bob since his return other than as they passed once in a corridor. He was as busy as she. It was right after Dykstra had notified her of the time of the funeral service for Pops. She had neutrally greeted Bob when she saw him and asked, "Will I see you at the funeral?"

"No," he'd said. "I'll be out of here again by then. Commander Le and I are being sent to Jupiter with a big ferry boat to try to get out most of the VIPs before the Phinon wave breaks."

Her again, Sammi had thought, but then it was back to work for both of them.

Late at night two days after that Sammi looked up from her screen with bloodshot eyes and decided to take a break. She couldn't go to sleep—not yet, not with so much work to do. It occurred to her that now might be a good time to go down and look at the Phinons in their cage. In fact, it was her last chance to see both together since one was scheduled to be carved up tomorrow. *Specimens. That's all they are.* She was interested in hearing how the Phinons talked since they did communicate vocally, though perhaps not exclusively that way. She'd been told that it was a "clicky-clacky" sort of language, whatever that meant. She hadn't had time to listen to any of the recordings that had been made.

Sammi took the elevator down then walked slowly along the rough corridor. At this level, the walls were just bare rock. *If Chris's bad scenario comes about, I might be seeing a lot more of these kinds of hallways. It's just a cave really. Be a helluva way to live.*

Just before she entered the viewing room, she heard voices, and strange, well, clicky-clacky sounds. She walked in to find no one there except for Hague. "Hi, Arie," she said.

"Yes, oh yes," he said, then: "Clickety-click, click, clack clack clack, kickle-kick, t'ch, t'ch, t'ch." He was staring at the two Phinons. It was clear he wasn't responding to her, had never even noticed her enter.

Sammi stayed for ten minutes, tried to search her feelings, but found nothing inside her right now except for a stone coldness. *Or is it numbness?* She didn't know what she'd expected to find. Some kind of epiphany? *Specimens. Just specimens,* was all she could say about the Phinons. She left with that thought on her mind.

Hague, intent on the Phinons in a way only he could be, never even knew she'd been there.

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XII

"Colonel, pardon my French, but just what the hell have you been up to?" Dykstra snapped. He was alone with Knoedler in the colonel's office. Dykstra had not bothered to let the colonel get a word out of his mouth before launching into him. "Why don't we have more ships with the new impellers? We should have hundreds of ships converted over by now. You strongly implied to me that that is exactly what you intended to have happen. I know you—you would have started even before the *Hyperlight* set off. Yet I can find only fourteen in all of the Solar Union, and that includes the *Hyperlight* and your personal ship. And, oh yes, that spaceliner you had converted over that Lieutenant Nachteggall and Lieutenant Commander Le will be taking to Jupiter."

Instantly defensive, Knoedler attempted to explain himself. "Converting ships over takes time, Doctor. We have to build new facilities. I had a hell of a time even trying to sell my superiors on the idea at first. And besides . . ." Knoedler trailed off.

Dykstra just stared at him, boring in with his eyes, conveying that impatient and annoyed sense that said "Would you please remember who it is you're talking to."

"Okay, you're not buying it. Fine. I won't *tell* you yet, Chris. The situation with the Belt is still too precarious. If they find out what I've been up to, they'll get skittish. I ran roughshod over everyone I had to. I lied, mischaracterized, and bullshitted in quantities a cattle ranch couldn't match. I've been playing more than hard ball. It's baseball with grenades. This time *you're* just going to have to trust *me!*" Knoedler finished with a pounding fist on his desktop.

"So be it," Dykstra said. "Now what is it you wanted to talk to *me* about?"

Just then Nikki Le entered with coffee for both of them. This was not a duty Knoedler typically asked her to perform. If he ever told her it was expected, Nikki was more than willing and able to tell him where he could go and how to get there, with a kick in the butt to get him started on his way. *And Colonel Tommy would just take it from her, too. He's smitten*, Dykstra thought.

"Thank you, Commander," Knoedler said when she set the silver cups before them.

"Will that be all, Colonel?"

"Yes. Thank you," Knoedler said, eyes unknowingly alight.

The eyes forever betray the longings of the soul, Dykstra thought, but he kept it to himself.

"You knew about the military expedition to the Phinon fleet?" Knoedler began. Dykstra nodded. "Fifty

ships, thirty-five System Patrol, the rest Belt. They intercepted the tail end of the fleet yesterday. We needed to see how we could do against them ship-to-ship when you take FTL away from them."

"You're obviously not happy," Dykstra said. "We didn't do so well?"

"Oh, we did great. Had a kill ratio of over three-to-one. Their ships wouldn't even turn around to engage. And they wouldn't fire until fired upon. But then they'd throw everything at us that they had until they were spent, then self-destruct. We lost thirty-eight war boats out there, Doctor. That's a significant percentage of our combined fleets of military craft. They lost over a hundred. That's nothing to them." Knoedler had gotten up and was pacing his office. He continued: "Given a year and an infinite number of credits, we could convert over every suitable barge, tug, and pleasure boat in the Solar System into some kind of warship, and we might have twenty thousand or so. At a three-to-one kill ratio that still leaves them over a million ships to mop us up with."

"The situation does look grim," Dykstra said. "Doesn't surprise me."

"That's right, God *damn* it!" Knoedler shouted at him. "It doesn't freaking surprise you. Why the hell *not*! It surprises the shit out of me. What the hell *are* they, Chris? You've kept it to yourself—what you think about them, what kind of beings you think they are. You risked being executed for treason so your people could collect those two we have locked up in the basement. I need to know *now* what kinds of things we're up against." Sometime during his tirade Knoedler had resumed his seat and was leaning toward Dykstra with his hands out, begging.

"Okay. I believe we're up against a billion years of evolution of a purely operant intelligence," Dykstra said. When he didn't continue, Knoedler got annoyed.

"Great. Now what does that mean?"

"It is the functional equivalent of saying we are up against creatures without souls, but that doesn't sound very scientific."

"Well, of course not. No one knows what the soul is, or even if it is—"

"Well, we're about to find out," Dykstra snapped, interrupting, "because we are at war with an equivalently intelligenced species that doesn't have one. Are you going to argue with me at every point, Colonel? That I will not tolerate."

Knoedler looked like his head was about to explode. Dykstra allowed himself to sink just a little more limply into his chair, shamelessly playing the frail-old-man bit visually.

At that, Knoedler laughed. "Aw, shit, Chris," he finally said. "Okay, consider me abashed. Lecture at will."

"The Phinons do not think the way we do," Dykstra began. "They do not invent technology—they evolve it. Phinons do not make intuitive leaps. Given sufficient time their technology eventually evolves the same way a biological organism does, through fits and starts. Sometimes they miss the obvious—the non-variable collimation of their X-ray laser hand weapons is a good example. Sometimes they scale Promethean heights. The beam truncation ability of the same weapon is a good example of that—even I'd never thought of that wrinkle in my physics."

"So you're saying that Phinons don't think?"

"They think, Colonel. Like a machine thinks. And that can look quite clever, indeed. But we need not look for any Phinon political structures, no military command, no formal structure at all that we would think of as one. The Phinons as a whole, or at least the ones in this part of the galaxy, are responding to the stimulus that is the human species. What we are seeing now would be absolutely predictable to someone who has had perhaps ten thousand years to observe them."

"And we haven't had the time. But where does the soul fit in?"

"Have you ever heard of B.F. Skinner?" Dykstra asked.

"Twentieth century psychologist, right?"

"Correct. He viewed all organisms, people included, as being nothing more than the sum of their learned responses to the multitudinous stimuli one encounters in life. Some of his techniques are still in use and are a godsend to folks suffering from some disorders, particularly phobias. But as a psychological theory his views were pure reductionist twaddle, not unlike the same sort of stupidity that held biology back at the turn of this century, and psychohistory back four decades ago. But I digress. Nobody lived like they were only the sum of their responses, and other than Skinner's assertion that they were, there was never any evidence of it.

"But the Phinons *are* the sum of their experience and evolutionary history.

"Now I need to present you with two sets of facts that we have confirmed since the men returned with their data. One, the Phinons have just the technology sufficient to fully exploit the ecological niche that is—or rather, are—the cometary halos. That, plus enough extras to handle whatever other life forms were out there that they had to wipe out. Two, the dead Phinons from the first comet the men visited died around a hundred *million* years ago. The two bodies alone differ in age by over two million years. And yet there is virtually no difference at all in their physical structure from that of the hostages we are holding below."

Knoedler looked stunned. "You mean they've been occupying our Oort cloud for at least a hundred million years?"

"Not necessarily. Recall that comets, in addition to being left over from planetary system formation, are also formed by exploding planets, an additional by-product of asteroid belt formation. Van Flandern demonstrated this over a century ago. That first comet the men visited may have been occupied by the Phinons when it was light-years away from us. We found no evidence that Phinons move their comets, so it drifted into its current location near our star. The point is that the Phinons have remained virtually unchanged for at least a hundred million years because overlapping Oort clouds constitute a truly huge ecological niche.

"That is why their technological level is so close to ours—they've been at the same level for millions of years, with a hyperdrive just adequate to exploit the comets within the galaxy. Over the duration of their existence, the Phinons must have routinely run into species that met them when at a technological level just below their own."

"What do you suppose happened to those other races?" Knoedler asked.

"I think we're watching a replay right now," Dykstra said.

* * *

The conversation had been going on for hours. Nikki Le had been listening in the adjacent room, and had twice more brought in coffee and sandwiches while the two continued the discussion.

Nikki couldn't follow most of it, of course. Dykstra was the genius of the age, and Knoedler (*My Tommy*, she thought, smiling to herself) had an IQ in the ordinary genius range. Whenever the colonel asked for a clarification, though he seemed satisfied with what he got, Nikki remained deeply in the dark.

Finally it was over. As Dykstra was leaving, Nikki was amazed that rather than seeming worn out, he looked invigorated, and left carrying rather than using his cane.

With the door closed, Knoedler took her in his arms and kissed her, hard. He was the one that was exhausted, and Nikki made him go back into his office and lie down on the couch where she joined him and began giving him a back rub.

"Oh, that feels good," Knoedler said. "How am I going to get along without you?"

"*You're* the one ordering me to go to Jupiter," she said.

Knoedler sighed. "Have to. I need someone I can trust. You'll be picking up VIPs from both the Jovian moons and the little rocks. Those are the two groups who got us into our recent little war. Nachtgall is a good man, but I want a mission commander who can also be a diplomat."

"I'm not sure if I should feel proud or insulted by that," Nikki said, continuing the massage. "I was listening to the whole talk with Dykstra. Didn't follow it though. Did you find out what you wanted to know?"

"Nikki, make a dozen copies of the recording of that conversation. Dykstra's view on the last century is iconoclastic, but . . . Geez, he tied together old science fiction; punctuated equilibrium; the work of Kuhn, Van Flandern, Hawkins, and Graneau; Calvinism; the *Chronicles of Narnia*; and the behavior of trees in a pest-infested forest, just to name a few. That was the most astonishing intellectual *tour de force* I've ever heard of in any way, shape, or form. Dykstra is probably the only scientist responsible for two paradigm shifts in the same discipline—Dykstra Hyperphysics is going to replace Dykstra Field Theory as the ruling paradigm of the twenty-second century.

"The future is going to want to remember what Dykstra just told me. It's going to want to see what the best brain of any dozen ages is capable of given a century of experience.

"That is, if we have a future."

* * *

Even though Hague had been watching the Phinons for three hours before Samantha came, he was still observing them more than ten hours later when two armed guards and a doctor from the biology section of the Phinon Project arrived to take away Te'chk.

Of course, he was the only one who knew that was the Phinon's name. Though name was probably too strong a term, Hague realized. Designation was a better fit.

It was true that Hague had failed completely to notice Sammi's presence earlier, but that was actually a very rare thing for the savant. Sammi and all the others whom Hague now thought of as his friends would be astonished to know just how aware he was of his surroundings. They were used to thinking of him as being pretty much, if not oblivious, then uninterested by the goings-on around him. This was not at all the case. In fact, the only other time since arriving on the Moon that Hague had been unaware of his surroundings was when he'd received the note from Dykstra to consider what would happen if two hyperdrives were operated next to each other. Every single other event was firmly locked inside his brain, and instantly accessible. For Hague, there was no such thing as a faded memory—events of decades before were as clear as yesterday, or even yesterminute.

The other three men did not object to Hague's presence as they went about removing the Phinon. First they adjusted the holographic controls while the Phinons were standing some distance apart, and suddenly a wall appeared between them. A sudden blaze of clickety-clacking raged between them until a real wall dropped down within the hologram and cut off the conversation. Then gaseous PMDP was pumped into Te'chk's side and the Phinon went limp.

"Off to dissection, oh yes," Hague thought. "Oh, yes."

If all humans could be described as bodies of water, then some would be no deeper than a mud puddle, while others would be veritable oceans. No one would argue that Dykstra amounted to anything less than the Pacific in this analogy. What almost no one understood was that Hague would be the Arctic Ocean, covered over entirely by ice, except for one small hole from which emerged those glimpses of his genius and an unending supply of "oh yeses."

Hague was sure he understood the Phinons. He'd learned their language, and been frankly bored by it. It was a very logical means for conveying information, but much of the conversation between the two aliens had consisted of "guard duty speak"—"See anything?" "Nope. You?" "Nope."—and they displayed nothing remotely like human curiosity about their surroundings. They knew they were in some kind of cage, that they'd been drugged, that the Chk-chk-clickle (their term for humans) had brought them here. They reaffirmed those facts to each other dozens of times while Hague had been listening. But there was something missing from these beings that was not missing from people, and even Hague's squirrels seemed to have an interior illumination that the Phinons lacked.

"Like the spiders, oh yes. Very much like the spiders." Unknown to anyone except himself, when Hague was seven he'd watched spiders for weeks. The little denizens of the corners had followed humans into space, and the asteroidal corridors Hague was used to had been a nice home for them. He'd admired the web building skills of the spiders—the aerial wizardry displayed in the weaving of the little biological machines.

The Phinons were like them, only they had technology. Hague involuntarily shuddered whenever he thought about that technology. It was so *wrong*. None of it could be found in the catalogs he knew so well. None of it was derived from earlier primitive forms that he was familiar with. It was a bizarre collection of exotic capabilities and missed opportunities and Hague hated it, reacting to it with the deepest of revulsion.

Not unlike the way an ordinary person might react to a living Phinon if he met up with one in a dark alley somewhere.

That the Phinons were ugly was completely wasted on Hague.

Once Te'chk was hauled away, the holographic wall was removed along with the real separation. Hague continued to watch as Ti'kak looked around for its former companion. The rods and pistons that moved the Phinon's head around twisted that sensory node in an efficient search pattern. It said: "Te'chk(?) Te'chk(?)." Several minutes later it gave up the search and said: "Kittle-click chack-chack Ti'kak."

"Yes, oh yes," Hague said. "You are alone, oh yes." And then he also departed.

* * *

Rick couldn't sleep.

He tried for over an hour, but the fact that he was supposed to speak at the funeral for Pops tomorrow, and that he still didn't know what he was going to say, made it impossible. Now he was sitting at his terminal staring at a blank screen.

Why did I volunteer to say a few words? Rick thought. But then, he was the last one to see Pops alive, and Bob was off Luna again. He really did owe it to those who'd known him to say some things.

But what?

This is stupid. I just got back from fighting Phinons and now I'm nervous about a couple of minutes of public speaking. But being logical didn't even bring a single yawn.

He looked toward the bed. Paula was only half-draped by the covers and seeing the outline of her naked breasts in the dim illumination brought a flood of delightful recent memories. Paula hadn't moved in with him, but by his second night back she'd sort of stopped returning to her quarters at night.

Rick still wasn't sure what to make of this relationship. There was so much more he would have liked to have known about her before sleeping with her so routinely. *At least my mind thinks that. But she's so damn beautiful. Even if she told me she only wanted me for my money she still could get me into bed.* Whatever. He couldn't say that he had any complaints about the situation. He looked at her again. Nope, not a complaint at all.

That first night of his return she'd come over and they'd shared stories about Pops. She made him tell her every detail of the old guy's last minutes. When he'd elaborated on just how brave Pops had been, Paula had started to cry, and then one thing had led to another . . . *Several times that night,* Rick recalled, smiling.

But that brought him back to the task at hand. *I'll just tell them about those last few minutes of Pops' life. How he stood to fight. How he sent Bob along. I don't have to say anything else.* And suddenly words started to fill up the screen, though even as he typed them Rick knew he wouldn't be looking at his printout tomorrow. He wouldn't need to.

He felt a hand on his shoulder. He hadn't noticed Paula waking up. She hadn't bothered to put on her robe. "Are you almost done, honey? I'm getting cold back there."

He stood up and her nude body melted against his. "Save and print," he said to the terminal. Then their hands found now familiar but pleasurable places, and with Rick navigating, they made it back to the bed.

They made love and it was good. Very, very good. Paula took him like he was the last man in the world,

and these were the last days.

* * *

Two hours before the funeral, Rick met his father in the visitor's suite. Wayne Vander Kam had come up for the funeral since Pops had technically been in his employ at the time of his death, and also because he had business on the Moon. Although Rick and his father had talked several times since his return, this was the first time they'd met face-to-face. His father shook his hand.

No hug this time, Rick thought.

"I'm glad you could come, Dad," Rick said.

"So am I. Even came up in a streakbomber retrofitted with the D & H drive. Killed two birds with one stone—the ship was coming here anyway. But right now, we have an appointment in Colonel Knoedler's office. We have to go get Dr. Hague first, though."

They left the suite and set off for Hague's lab. On the way, Rick brought up Paula. "Dad, there's someone I'm going to want you to meet. You'll see her with me at the funeral. Her name is Paula. She's one of your propulsion techs—"

"A propulsion tech? You sleeping with her? How well do you—"

Rick stopped right there, took his father by the shoulder, and pulled him up short. His dad hadn't even noticed what he was saying, Rick was sure. He was just back in his automatic pattern. "That is enough, dammit! I just got back from the Oort cloud. I was fighting the Phinons. You think I give a shit about what you think of the woman I want to be with? What happened to that soft-hearted father who couldn't bear to see me go, huh? Junior's back so now you can go back to being an asshole, is that what you think?"

Rick watched the fire flare in his father's eyes, but then like a match snuffed by a pair of wet fingers, the flame went out. Then he said, "You're my youngest boy. You're probably going to have to keep reminding me that you're a man for a while yet. I'm sorry."

In relative silence they proceeded to Hague's lab, and Rick neglected to tell his dad about the squirrels. When they opened the door, there was the oak tree with Hague standing in his vest, five squirrels running around his trunk, saying, "Here you go, Sarobi," handing her a nut.

"What in the *hell* is this place?" Vander Kam Sr. whispered.

"Arie, this is my dad," Rick said, enjoying his father's reaction.

"Oh yes, the elder Vander Kam. Oh yes. Very pleased to meet you, oh yes," Hague said.

After a few minutes Rick got Hague out of his vest and somewhat presentable and the three set off for the colonel's office. "I forgot to ask—why are we meeting with Knoedler?"

"You'll see."

Knoedler's temporary assistant ushered them right into the office. The colonel was standing beside a woman, fiftyish, Rick decided, wispy looking, and yet . . . *This woman has edges*, he thought.

Hague looked at the woman and said, "Hello, Sarobi, oh yes, hello."

Sarobi's edges went away and she rushed to her brother. Tears were streaming down her face, rolling off cheeks that Rick was somehow sure had been allowed to feel precious few in her lifetime.

"I found her, Rick," his dad said. "Wasn't easy. This is one very resourceful woman."

"But years ago when that 'mistake in Dykstra's work' paper came out, Sarobi started paying attention to what was going on in the Belt," Knoedler said. "She traveled there but couldn't find Arie. She got a message to my office a few years ago about her brother and what he was able to do. That set me on the track to find him, and initiate the raid to get him. But I'd never met her until today."

"You can talk," Sarobi said to Hague. "You learned how to talk."

"Yes, oh yes," Hague said. "I talk very well, oh yes."

"And like the old professor, I notice," Sarobi said.

"Oh yes."

"Professor?" Rick asked.

"Our parents were dying," Sarobi said. "They shoved us in a life pod and we made it to Ceres. But in those days, just after the war, help wasn't easy to find. Packs of children were on their own in those tunnels. To make money I'd find people with broken tools and offer to get them fixed better than new for a price, then I'd bring the tools back to where Arie and I were holed up, he'd fix them, and then we'd be okay for a while. But finally one guy found us, and ultimately Arie was left with old Professor Kirk and I went on to Earth. Kirk said 'oh yes' a lot. Arie wasn't speaking yet when I left. I guess when he decided to, he copied the Professor."

Then Sarobi turned back to Hague, and in their own ways, they got caught up.

"Thanks for finding her, Dad," Rick said softly.

"You won't ever have to worry about Arie, son. Capitol Products is taking them both in. Sarobi is going to work for me. Arie isn't the only one in that family with remarkable abilities."

* * *

Sammi was standing outside the door of the chapel when Rick arrived. *I'm surprised she came. Funerals remind her of Steve so much, and this one is like his—no body.* "Hi, Sammi. How are things?"

"Oh, I'm deluged," she said. "The Phinon dissection data is astonishing. And you guys bringing back those two in the middle of mating is telling us more about the range of their physiology than we could have hoped for . . ." and she prattled on.

This is hard for her, Rick thought. *She's talking shop to keep her mind off where she is.* "Bob will be glad to hear about what great specimens we brought back. Too bad he's gone with Nikki and . . ."

Rick continued talking but he was looking at the way Sammi's expression darkened at the mention of Nikki. After he finished she politely but abruptly ended their conversation and took a seat in the back at the end of a row.

A few moments later Paula arrived, dressed tastefully and demurely in black. Rick could tell around her eyes that she'd tried makeup, probably cried, then given up the idea of anything elaborate with mascara. They sat down in the second pew from the front.

Soon the ceremony began. The religious part was generically Christian. Pops' records listed him as a Baptist. But no one could find any relatives of the old soldier. *No family for Pops. No wonder he never went back to Earth.*

The service went as well as could be expected, given a chaplain who'd never known Pops, but soon it was Rick's turn to speak. He held his sheaf of notes as he walked up to the podium, still certain he wouldn't need them. Then he looked out into the sea of faces.

The sea of faces. In addition to Paula and Sammi and Chris; his father; Knoedler, Sarobi, and Hague; and other expected guests, were scores of military men. They were all in their best dress uniforms, of all ages, of ranks spanning the range from general to private, admiral to midshipman. Rick even saw more than a dozen Belt uniforms, but somehow there was no such thing as System Patrol and BDF here.

I should have known, Rick thought. *I see you did have family, Pops.*

"Let me tell you about my friend," Rick began, and then he saw Sammi stand up and walk out.

* * *

How long has it been since I last gave a seminar? Sammi thought to herself as she stood at the front of the theater giving her opening remarks. The Phinon in the cage behind her was simply standing, seemingly looking right out at the crowd even though it couldn't see anything but "wall" in that direction.

Dykstra was there, as was Knoedler and Hague. Rick was not, but then, he hadn't been invited. This demonstration did not fall within his need-to-know according to the rules. Of course, it didn't fall within Hague's either, but now everyone knew that he could understand Phinon "talk," so he had been included. The crowd was rounded out by Andy Fine, some additional workers in the biology section, and the usual interested brass.

"My original genano symbiotic organism had been designed to separate iron oxide molecules into their constituent elements. Since the Phinons have steel skeletons, it was Dr. Dykstra who thought my expertise might be applicable to the Phinon problem. It was fairly easy to redesign the genanites to promote rust instead of undoing it. After all, that's pretty much what iron and steel *want* to do when in the presence of oxygen." Oh how that paragraph glossed over what really happened, Sammi knew. But she had been asked to be brief, and she'd wanted exactly that herself.

"Working with dead Phinon tissue, I was able to tailor a genano organism that could do away with the bacteriological component and live within the Phinon itself. However, living wasn't enough—it also had to be able to manufacture its tools and meet our established mission criteria. This was accomplished even before the arrival of the living specimens. However, recent work with live tissue allowed me to fully quadruple the effectiveness of my previous best attempt." In truth, the phenomenal Phinon regenerative capabilities would have rendered her original bug nearly useless. Andy noticed it before she did. Fortunately, she was well on her way to making modifications to take advantage of the regenerative systems before they discovered that fact, and thus saved herself from a bout of depression and feeling like a failure. *If Bob and Rick hadn't come back with live Phinons, we'd be dead for sure.*

"This genanite is tailored to settle initially in the Phinon `lungs' and begin rapid reproduction. It will then enter the circulatory system or be exhaled into the environment. With the amount of genanites we expect to inject into the Phinon ships, the infections will be massive, adequate even without reproduction to kill the Phinons on board."

Sammi continued for a few minutes more. She went into the details of how her one organism would "split" into two types, so that on average only half of the Phinons infected would show prompt symptoms while the others would hopefully last long enough to infect others back at their home comets. But apart from Dykstra, Andy (now), and a few of the biology Ph.D.s, she knew she was speaking over their heads.

"And now, there is nothing left to do but begin the demonstration," Sammi concluded. She was looking

right at Dykstra when she said it. He looked proud of her and gave her a discreet thumbs-up with the hand he had resting on his cane. Hague was looking intently at the Phinon. Once Knoedler had found out what Arie had been doing, he'd had the savant listening to every piece of possible Phinon ship-to-ship chatter that the Patrol had been able to gather. Knoedler himself looked positively grim.

The crowd heard a brief hiss as the genano agent was introduced into the cage. "Effects should be noticeable within minutes," Sammi said, taking her seat.

More like seconds.

Immediately the Phinon let loose with a series of sharp *chuffing* and *whuffing* sounds, their equivalent of coughing and sneezing, from the breathing hole in its chest.

Chuff. Chuff. Chuff-chuff-chuff. Whuff, whuff. "Click-clackle'chk, clk'ick?"

"Oh yes, Ti'kak does not know what is wrong. Yes," Hague said. The rest just watched. Sammi could not have had her gaze torn away by anything less than a hook and winch.

Another staccato burst of *chuffs* and *whuffs* was ripped from the Phinon, followed by a hideous series of convulsions. The arms and legs with their backwards joints jerked everywhere—straight out, curled up, and then in sickening gyrations. The Phinon was tossed about the chamber by the violence of a body dying, and going hopelessly out of its control. Briefly, the alien would regain a measure of control, only to fall into deep shudders and convulsions again.

It let out with a long, mournful wail—or so it sounded to Sammi. "Ti'kak is frightened, yes," Hague informed them.

Then, starting with the smallest, the four rod tendons of the Phinon's arms snapped, one by one. Its arms fell to its sides, though were still thrown into motion by convulsions, though they these were rapidly weakening. Lesions began to form on the Phinon's skin. Although Sammi's bugs were intended to attack the skeleton, steel filaments were threaded throughout the alien's body—the ugly sores were testament to that.

The Phinon tried to stand; its leg snapped in the thigh, bending like a second knee, perpendicular to the original.

"Nasty stuff," Sammi heard Knoedler say.

Sammi still couldn't pull her eyes away even though she was getting sick to her stomach. The Phinon was beginning to resemble an octopus stranded by low tide. Its facial structure had crumpled; the head flopped over like an underfilled water balloon. All of its limbs were compactifying now, the tissue contracting as the steel skeleton flaked away inside. The lesions had bubbled up into boils which began

to pop and leak slimy fluids.

Somehow the alien wound up on its back, its breathing orifice pointing straight up, like a bean bag with a blowhole. Slowly it started to ooze over. It released one last weak wail. "Oo-oo-oo-oo ch'k! Ti'kak?" followed by an obscene gurgling sound.

My God, it still isn't dead! Sammi thought, horrified.

"Ti'kak knows he is dying, oh yes," Hague said.

She'd ignored the warning signs too long. When the urge to vomit struck, Sammi had no time to rush out of the room. She bent over and lost it on the floor.

She was sure she'd been retching for a good five minutes. Still bent over, she felt a hand on her shoulder, and another on her forehead. Memories of her father helping her during a childhood bout with the flu came to her. It was Dykstra. He'd gone out and returned with a glass of water for her. She sat down, took a sip, swished it around in her mouth, shrugged and spat it out on the floor. She swallowed the next sip. It was then that she noticed how few people remained in the room.

"You weren't the only one to blow your groceries," Dykstra said. "You weren't even the first one to lose it. Andy beat you to it."

"Where is he?"

"Restroom."

"I thought I had some idea . . ." Sammi began. "Oh God, Chris. I never imagined it would be like that—"

"Impressive work, Ms. MacTavish," Knoedler said, unknowingly interrupting but already on his way out.

"It was so *disgusting*, Chris. Can we really do that to them? It was so . . . so . . . *inhuman*."

Dykstra just looked kind of sad. " `Inhuman'?" he mused. "Odd word for a class of behaviors so typical of our species."

Hague was still standing in front of the viewer, looking in. "Yes, Ti'kak is dead. Oh yes."

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XIII

The *Vegas Star* was a huge luxury liner, fully 300 meters long, filled with 22 casinos, 41 bars, 8 lounges, and 442 well appointed staterooms. Just recently she had been equipped with several thousand cots, tons of extra food, and the Dykstra-Hague impellers. On the way to the Jovian system, despite the room, she currently had only two occupants.

I've been on more luxury boats since this war started than any other time in my life, Bob thought as he walked through the corridors. Dykstra had not confided to the lieutenant his concern about the relative scarcity of spaceships equipped with the new drive. Bob was simply content to have the opportunity to pilot another ship with the drive so soon after losing the *Hyperlight*.

Bob turned a corner and entered the Starlight Lounge. Soft music was playing there, and Nikki was sitting at a table in the middle of the room, her dinner plates pushed aside, her computer pad aglow. She'd come down here to work and grab a bite to eat.

Nikki was dressed simply, in a jumpsuit with no special adornment, an outfit seldom seen in such an elegant setting as the lounge. Still, she was a beautiful woman, a tad bit tiny for Bob's taste, *but you know what they say about small packages*.

Bob had been a complete gentleman the entire trip. He knew that she and Knoedler were an item—she'd clarified that immediately even before the *Hyperlight* had been abandoned. And besides, she was a lieutenant commander.

"Itinerary update," Bob said, taking a seat at the table.

Nikki looked up. "Oh, goody. What new disaster this time?"

Bob handed her a memory cube. "Nothing that qualifies as a disaster. Just a couple more names of people we have to try to get off Ananke." Ananke, though one of the twelve classical Jovian satellites, was a trivial moon only seventeen kilometers in diameter, orbiting on average over twenty million kilometers away from her primary. Most people from the inner system had no idea just how damn *big* the Jovian system was.

"Anything new on the Phinons?"

"The High Command has been monitoring them steadily. They still show no signs of slowing down, nor even of turning. But since they accelerated at six gees for seventeen hours once they got going, everyone assumes they'll do the same thing in reverse once they get to Jupiter. We just don't know how the Phinons define 'get to Jupiter.' "

The Phinon armada had accelerated up to a velocity relative to Jupiter of nearly 3500 kps. They'd been coasting ever since for sixteen days, and if they did nothing they'd reach the Jovian system in another ten. Bob expected to be gone from Jupiter with at least one day to spare. But there were so many people of varying degrees of importance that just *had* to be evacuated, or so said the governments of both the Solar Union and the Belt.

The Great Jovian Exodus had happened almost immediately upon the news of the Phinon fleet reaching Jupiter. There was no way to keep the knowledge under wraps, and once four people found out, it wasn't long before the entire population of four million plus found out, too. At that point, anyone with access to a ship loaded up his family and fled. Dozens of the super rich suddenly discovered that money didn't buy enough loyalty to keep their pilots from stealing their yachts and heading for the inner system. The same was true of governmental figures. Even the governor of Ganymede had been left behind in his mansion.

Bob and Nikki were constantly receiving information updates to assist them in plotting the most efficient schedule to maximize the number of VIPs they could evacuate. Bob didn't see how it mattered. They were going to visit three of the Galilean moons first, then Himalia in the intermediate group about eleven million clicks from the giant planet, and finally Ananke and Sinope in the distant outer group. It was also at these last two satellites that the Belter dignitaries with their tiny rock hopper spaceboats (ships too small to set out into the Solar System proper) were supposed to congregate. There was no way the *Vegas Star* could visit any of the myriad "little rocks" that the Belt and Solar Union had been squabbling over.

"I'm sure the colonel will keep us updated if the Phinons do anything we need to know about," Nikki said.

"If for no other reason than that he's in love with you?" Bob asked, smiling.

"The *only* reason, Bob," she answered. "By the way, I'm supposed to jettison you before we leave Jupiter to make room for one more dignitary."

Bob laughed. "I wish I had someone waiting for me when I get back. But no. Just a cold, empty room and cold meal to eat alone—"

"But you do have someone," Nikki interrupted, cutting off Bob's silly soliloquy.

"Huh? Who?"

"Samantha, you dummy."

"Oh, right. Rick told me that same bullshit when we were on the *Hyperlight*. Got me believing it, too. Then we get back and it's still shiver city from her."

"Bob, you told me you met Sammi when Steve was still alive. You took her to meet Dykstra."

"Actually, I met her before that when I dropped off some files," Bob corrected. Nikki gave him a stern look.

"Anyway, I know what she saw when she first opened that door for you—one prime male specimen. Stop blushing! Her husband had been away for quite a while, and she most certainly felt a physical attraction for you. Many women would just shrug that off as something natural. Sammi would feel guilty about it. And then Steve died. That's what's so desperately hideous about having a spouse die. Just when you need comforting the most, your main source of comfort is gone. And still there would be attraction for you, and in the fog of hurt somehow she'd think those moments of attraction were the cause of Steve's death, that she was being punished . . ." Nikki trailed off.

"Drawing on some personal experience, there, Commander?" Bob asked softly.

"I told you about Luke," Nikki said. "My impression is that war adds a sense of urgency to everything. I'd never be with Tommy this soon if I hadn't lost Luke in a heartbeat. I doubt if Luke and I ever would have been more than friends. But my first impression of the colonel was different and I was not going to waste time. Good thing he felt the same way.

"But, we were discussing Sammi. She just needs time, Bob. In fact, I'm sure by now she's had enough."

"I haven't seen any evidence of that."

"You have to know where to look. When you told me about how you felt about her on our way back from the *Hyperlight*, I wanted to see her face when she saw you again. Do you remember? We walked off the boat together. Her face flickered through rage, jealousy, disappointment, and resolve, all in two seconds. She saw you coming off the boat with *moi*, and figured she'd lost her chance."

Bob thought about that. "Think I should talk to her?"

"No. Let her come to you. She knows about Tommy and me now, and you're *not* supposed to know about how she felt when she saw us together. Just keep your mouth shut and be patient."

But patience turned out to be something Bob needed in spades after they arrived at Jupiter.

Picking up their passengers from the inner satellites, all members in good standing of the Solar Union, was accomplished with a minimum of fuss. The governments still maintained discipline, and the local infonets were loaded with commentary, no small part of it suggesting that maybe the arrival of the Phinon fleet wouldn't be so bad. After all, the Galilean satellites were bigger than some planets, and the cities went down pretty deep, and every last citizen would be armed by the time the Phinons arrived.

One optimistic voice even suggested that the Phinons were probably only going to use the mass of mighty Jupiter herself to effect some kind of orbital maneuver. Since that idea defied logic, Bob and Nikki assumed it was just happy talk to keep up the spirits of those who had no chance of escape.

After stops at the inner moons, the *Vegas Star* was quite comfortably populated. It had been planned in advance that Ganymede would provide the ship with a support staff to maintain order on board, and the trip from Callisto to the four midway moons was hardly different from a typical vacation cruise. Even the casinos got up and running by evacuees with vacation resort training in their backgrounds.

The Jovian system can be thought of as consisting of three separate, and by no means equal, subsystems. In close to Jupiter are the Galilean giants, all orbiting within two million kilometers of the planet, smack in the equatorial plane. A second group orbits at a mean distance of eleven million kilometers, but inclined to the equatorial plane by nearly 30 degrees. Of these four, Himalia is by far the largest, and even it is less than two hundred kilometers in diameter. Farthest out is another group of four, the retrograde miniature moons and most certainly captured asteroids. These exist in eccentric orbits of mean distance greater than twenty million kilometers from Jupiter, and at inclinations of over 150 degrees. Along with the moons are enough other captured rocks and boulders to provide Jupiter with her own miniature asteroid belt.

At the time of the settlement of the giant inner moons, the outer groups were left alone to be gotten to later, for it was understood that anything that orbited Jupiter belonged to the citizens of the Galilean satellites. The Belt, however, was less particular about whether or not obvious asteroids orbited both the Sun *and* Jupiter, and began to occupy the retrograde group in due course. There was nothing planned about it; the Belters just followed their fiercely independent whims.

But the "little rocks" were far richer in metals than the Galilean moons, and so it was inevitable that conflict would eventually arise.

But hopefully not on the *Vegas Star*.

With the ship populated, Bob and Nikki spent less and less time off the bridge, and even began taking meals there. They wasted an entire precious day at Himalia when an accident at the spaceport made it impossible for their passengers to leave the surface until repairs could be made.

"Oh great. Fine time for this to happen!" Bob had said, storming about the bridge.

Nikki, who had not been on watch but was trying to compose a personal letter to Knoedler, said, "Simmer down, Lieutenant. You knew our luck couldn't last. We planned ahead for forty-eight wasted hours. We'll still have twenty-four left by the time we leave."

"Yes, but I expected to lose all forty-eight at Ananke and Sinope. At heart I'm as independent as any Belter. But dammit, not when there's an impending disaster!"

They lost sixteen of the remainder at Ananke, and the last eight at Sinope. And they were still there.

After the stop at Himalia, the *Vegas Star* had become cramped; after Ananke, packed. Some of the acting stewards from below had made it known that most of the passengers felt it was time to *go*, and Bob was of a mind to grant them their wish. But Nikki was in command.

"One more hour, Bob. We'll give them one more hour. I'll call the mayor myself," Nikki said, trying to placate the lieutenant one more time.

"Nikki, um, Commander, the Phinon ships haven't turned around yet. HC is beginning to think they're not going to slow down at all, just come buckshotting through the system at thirty-five hundred kps. God knows what they'll do on the way through. I don't want to stay to find out. If they don't decelerate, the first ship will be here in three hours."

"Then we'll still have two hours to leave Jupiter before they arrive."

"At twenty gees? That's only five million clicks away by then," Bob protested.

"And a million more every seven seconds," Nikki shot back in pilot speak of her own.

"Fine," Bob said. "But let's leave at twenty-two gees. The compensation fields won't quite handle the extra two gees, but I don't think our passengers will complain too much about the discomfort."

Nikki nodded and Bob assumed that was a yes. She called down to the surface. Bob watched her affected smile turn almost instantly to a frown, then she glanced at the Dykdar screen and looked ready to chew nails. Angrily, she broke the connection.

"What?" Bob asked.

"The mayor of Sinope just informed me that the tiny skiff that's been orbiting near us is armed. Not with much, mind you. Just a couple of little missiles. But we don't have a damn thing to counter them with!"

"Shit."

"He says we'll be free to leave when his people are all on board. He hoped another day would be sufficient to gather them all together."

"Great time to find a little tin god," Bob observed, then: "He'll have us blasted for sure if we try to leave. What does he have to lose? But I wonder what he'll do if we stay put? *Really* stay put."

"Oh?" Nikki asked expectantly.

"The Phinons are coming in from solar south. Since we're going to be here at the time they arrive, I wouldn't mind having the mass of Sinope between us and them. In another half hour or so we'll be in just about the right position. I'd like your permission to take us out of orbit and assume station keeping with Sinope instead. We can do that *forever* with our drive."

"And the skiff can't. Clever, Lieutenant. The pilot will be out of fuel in a few hours if he tries to stay with us. Permission granted," Nikki said.

It didn't take the mayor long to figure out what they were doing. He called, spluttering and threatening, but he needed the *Vegas Star* if he was going anyplace, and Bob was certain that the mayor wouldn't be able to bring himself to have them attacked while he could still look out his office window and see them hanging above the horizon.

They were still at a stalemate when the Phinons arrived.

As Bob had feared, the aliens did not slow down. And the first indication of what the Phinons would do came in the form of an explosion on the surface of Callisto, a flare visible from 20 million kilometers away.

"Holy Mother of God," Bob whispered. "Did you see that, Nikki? Did you?"

She hadn't been looking. "What?"

"Callisto. An explosion. One holy hell of an explosion. Gigatons, easy."

"No, I missed—" She was cut off by Bob pointing at another explosion on Callisto, then suddenly dozens, and then scores on Ganymede and Europa, too.

"Mass conversion bombs. They're strafing the whole system with mass conversion bombs. With over a million ships." The words trickled out, and even as they emerged from his mouth, Bob couldn't believe what he was seeing. He'd just left Ganymede a few days ago. Now, huge bombs were striking with such frequency that the surface of the world was lost in the glare. "Everyone there is dead already. Over a million—"

"Bob!" Nikki was shaking him. "Snap out of it, dammit! We have to get out of here."

"Shit. Yeah. Sorry," Bob said. He expanded the view on the Dykdar screen. Being a top-of-the-line luxury liner, the *Vegas Star* had a marvelous sensor array. After a few minutes it soon had an appalling display, time lags corrected, of the Phinon onslaught. "We're safe in the shadow of Sinope until they decide to hit it. But we'll have to look for an opening in this wave or we won't get out at all."

"Where's that monitoring ship now?" Nikki asked. The Patrol and the BDF both had ships positioned ten to fifteen million kilometers outside the Jovian system to gather data.

"I'll raise them," Bob said. "But lightspeed delay for a back and forth will be around two minutes."

"Just ask them to look for a gap. Hey, who the hell is that?" A light blinked on the board—there was another incoming message.

"—asking permission to dock. *Vegas Star*, this is Reggie Dukes. I'm the skiff pilot. Dammit, let me dock. Then we can all get the hell out of here!"

"What? Listen you stupid little shit! You're—"

"Nikki, Nikki, let him board," Bob interrupted. "It's the quickest way to get rid of his missiles. And we need all the pilots we can get. Boy, is the mayor going to be mad!"

Bob turned his attention back to the communications console. He didn't want to look at the monitors, didn't want to look out the windows. The three giant moons visible from their position would all be glowing now. No doubt Io would look the same once she emerged from behind Jupiter.

If there was anything left to emerge. Just how many bombs in the giga- or teraton range would it take to destroy a moon of Jupiter? *One, if they use it on Sinope*, Bob thought.

"I've called the guys down below. They're letting Reggie come aboard," Nikki said. "How are things on your end?"

"I've made contact. They were in thorough disarray over there, too. Just looking out the windows, I guess. We should have something in a couple of minutes."

They both had to look outside again. But the enormity of what they were watching had no scale to compare it against. Four million souls and a whole moon system, dead and gone. And this attack would go on for two days, seven ships a second to wreak destruction.

They were both looking at Himalia when it shattered.

A telltale went off on the comm board. "Data dump coming in," Bob said. With relief he left the view and sorted through the information.

There was good news and bad news.

"Nikki, there's a gap coming. In, er, 302 seconds, mark. If we go then, there won't be a Phinon ship close enough to blast us. One problem. We have to boost at twenty-nine gravities for eight minutes."

"But we can only compensate to twenty. After that—"

"Twenty-nine real gees will feel like seven-and-a-half."

"We have thousands of people on board, Bob. Hundreds of children. No acceleration couches. Most of them could die." Nikki closed her mouth into a thin, determined frown.

"It's your call, Commander. The alternatives are to stay or to leave at twenty gees and hope they don't fire at spaceships," Bob said. It didn't feel any better not to have the weight of command on his shoulders—not in this situation.

With resignation, Nikki said, "We can't risk either. Do it. I'll call below. I'll tell them to secure for seven point five gees in . . . damn . . . four minutes."

"Nikki, your hands are shaking," Bob said.

"I know."

Bob sat at the ready while Nikki made her call, staring at his nav display. Suddenly the sphere that represented Ananke disappeared from the screen. *So this is what it means to be between the devil and the deep blue sea.*

The ship was properly oriented for drive. Nikki, with thirty seconds to go, finally sat down in the Captain's chair. The chairs on the bridge were no more designed for high gee travel than any other chairs on board, but they were better than what their passengers had.

On the mark, the *Vegas Star* leapt from behind Sinope. The ship ramped up from twenty gees to twenty-nine in less than a minute, but it was the absolute maximum amount of time Bob could allow.

Bob and Nikki were crushed into their chairs, like astronauts from that nearly forgotten era before the Moon Rush days. The seats gimbaled so that the floor became a wall. Like all great ships in the era of artificial gravity, the *Vegas Star's* thrust axis was perpendicular to her internal gravity. Nikki's hands weren't shaking now. They couldn't, not with the crushing weight of acceleration upon them. They both knew what hell this must be for their passengers. Fortunately, just trying to ride out the high gee minutes themselves kept their minds off it. After forever, the internal acceleration dropped to zero on the mark, and all that remained was the standard one gee of the artificial gravity.

They got up. Bob hurt all over. With several groans of pain he went and looked at his nav display. "Just in time," he said. "Now Sinope is gone."

"We have to go below," Nikki said. "We have to see how bad it is."

They went down the stairs from the bridge to the main corridor. They could hear the wails on the other side of the door coming through the bulkheads. Kids were crying. Babies were screaming. Bob opened the door.

It was worse than watching Jupiter die.

The passengers and the staff had lined the walls with cots in a pitiful attempt to provide some relief from the acceleration. The flimsy cots had caved in within moments of the onset of high gee. There was swearing and screaming, they saw the crying children, and limbs bent in funny ways, and blood and vomit fouling every floor and every wall.

"Oh, God! It's like underground at Deepguard," Nikki said. "Oh, God!"

Bob was afraid she was going to collapse. He felt like throwing up himself, but he put his arm around her and held her up.

"I ordered this," she said. "I ordered this," she cried.

A man stood up in the hallway. He was holding a tiny, broken rag doll, cradling it to his chest. He spotted Nikki. "You! You're the captain!" He pointed at her in accusation. He turned the rag doll so Nikki could see. The doll had been a beautiful little girl—Nikki even recognized her, had noticed her when she came aboard, carrying a ragged blanket and a new teddy bear. "She was my girl," he screamed at Nikki. "She was my baby. Do you know what you *stole* from me! Do you know what you *did*!"

Bob got Nikki back to the bridge. He relieved her of command. She didn't notice.

* * *

Dykstra had been in this particular conference room many times. It was a favorite among the Intelligence staff. Three of the four walls were given over to display units. At the moment, the Jovian carnage was playing on two of them. To Dykstra's right glowed the remains of Ganymede. On the back wall, a cluster of Callistean fragments. But to the left, a diagram of the Solar System showing a continuous update on the status of the Phinon fleet was running.

It was like the handwriting on the wall. The fleet was turning. The Phinons were heading for Earth.

The conference table had ten chairs around it. Two of them were empty. One should not have been. *That's where Pops would have been*, Dykstra thought.

He looked around at his fellow conferees. Samantha MacTavish—she'd lost her husband to the war. Sammi had been pensive since the genano test on the live Phinon. Her moods reminded Dykstra of Jenny's. Beside Sammi sat Nikki. She had been sad and perpetually distracted since returning from Jupiter two days ago. Bob had told him what had happened on the *Vegas Star*. *Sad thing. Nikki thought she'd been tested to the limit when Luke got killed. And then to have killed so many of the innocent herself. It's never going to matter to her that she had no choice.*

There was Rick Vander Kam. He had a new love in his life. Dykstra smiled inside. *Or maybe not. These things flare up in wartime, and like a flare, can go out just as quickly.* And Lieutenant Nachtegall—Bob was in line for a promotion and a chest full of medals. *He's the modern equivalent of a Knight of the Round Table.* Arie Hague—an unprecedented man for an unprecedented time. Wayne Vander Kam, president of the most powerful corporation in the Solar System. *He could never get enough of Dr. Seuss,* Dykstra recalled fondly. Finally, Colonel Knoedler—there was a man with the weight of the world upon him.

And I, Chris Dykstra. How stupid of me to have cried over losing my house. Look at those images. Sigh. I lived just long enough to see the Saint's prophecy fulfilled. Will I also see it made moot?

Knoedler stood and began the meeting. "This is all of us," he said. "Along many different paths and by many different routes, Destiny has awarded to us the responsibility for the conclusion of this war. I've come to rely on all of you for your knowledge and your insight, and whatever we decide in this room will be the strategy that I recommend to the Joint Command of the Belt and System Patrol that we pursue with respect to the Phinons. And that's the same as saying that's what we're going to do, because the Joint Command isn't going to have any other plan."

He turned and gestured around the room. "You're all aware of what the Phinons did to the Jovian system. No need to elaborate on that, although sometime after the six hundred thousandth ship went through, they stopped bombing. Wasn't enough left by then. Our analysis of the attack shows that each ship released only one bomb on its pass through. Each ship could easily hold another fifteen to twenty bombs. We don't know. We also have video of spaceships caught out during the Phinon attack. The first Phinon ship within range destroyed them. Anything in orbit was also fired upon. For any of you wondering whether or not Lieutenant Commander Le and Lieutenant Nachtegall had any choice in subjecting their passengers to crushing gee forces, the answer is that they did not." Dykstra noticed that Knoedler was deliberately not looking at Nikki when he said that. Dykstra did look. Nikki was staring into her lap.

The colonel continued. "Dr. Hague has been able to interpret a good deal of the Phinon ship-to-ship communications. Their chatter is uncommonly prosaic. But it's clear that on their way to Jupiter they picked out their second target, the most heavily populated place in the Solar System—Earth-Luna.

"We have long planned on using genano warfare against the Phinons if necessary. To that end, Dr. MacTavish has developed a genanite that will kill the aliens quite efficiently. But it's no longer clear,

given the Phinons' attack philosophy, that the genano agent will prevent the Solar System from being destroyed no matter what we do with it." Knoedler resumed his seat. "The floor is now open for comment, though I would recommend that we allow Dr. Dykstra to speak first."

"Thank you, Colonel. What I wish to point out is that the Phinons are a purely operant intelligence. That is, despite the technological sophistication, they are creatures of habit and instinct and learned responses. They are tool users, but then, some species of crows make tools out of stones and twigs. Give the crows a billion years, and . . ." He shrugged. "But evolution is an undirected process, completely lacking in foresight. The way the Phinons are attacking us—it's grossly inefficient, terribly wasteful of resources, and entirely unnecessary since we would have been willing to live with the Phinons, even to simply ignore them. Now that we have hyperdrive, our species will care only about the volumes within Hague Limits. The space between the stars would belong to the Phinons forever. But they didn't ask us what our intentions are.

"Thus, to save ourselves, we are going to have to find some way to promote the Phinon flight reflex. If we can trigger it, their departure will be instant and unreasoned. But can we do it?"

"They didn't flee inside the asteroid," Rick piped up. "They just kept coming and coming."

"But they were defending their *home*," Sammi said, with emphasis Dykstra found surprising. "Where else were they going to go? I mean, haven't we been assuming that the Phinons flee to assure that the knowledge that `something is out there that can kill a Phinon' gets back to the rest of them? They didn't need to run and tell anyone once you were there."

"I see Sammi's point," Bob said. "But might they not also flee out of self-preservation? In Nikki's case, the other Phinon split when it saw its partner was dead. It might also have been thinking, `fifty percent casualty rate sustained.' That would be a good time for a retreat."

"What I want to know is why did they attack now?" Wayne asked. "They've been out there for God only knows how long. What did we do to set them off?"

"We demonstrated that we were at a technological level that could start to utilize the Oort cloud," Dykstra answered. "To them, we're just an infestation that started to happen, and the Phinons reached down deep into their stimulus-response bucket and pulled out their old `build reaction drive ships and go in there and kill them' solution. Were you aware that these ships don't even have artificial gravity? They're not retrofits after all. The pattern for building them may go back to the earliest years of Phinon development."

"But they look like the eight-man ships," Bob said. "And the comet we infiltrated didn't have gravity, either."

"Yes it did. Down on the lower levels," Sammi told him. "The biology group was certain it had to be

there since the Phinons you brought back showed no signs of sustained low-gee living. We found the emission signatures in data the *Hyperlight* brought back."

Wayne Vander Kam, who had been looking progressively more and more annoyed since Knoedler had opened up the discussion, asked, "Why are all of you so damn certain that the Phinons can't be reasoned with? Pardon me for coming late to the party, but it looks to me that if we can't talk them out of destroying us, then we're all toast. We can't fight a million ships, nor can we infect that many with Dr. MacTavish's miracle genano Phinon killer."

And then, for only the second time in Dykstra's memory of him, Hague spoke lucidly. "Because it would be like talking to spiders," he said. Seconds went by with everyone else silently looking at him, then he added, "Oh yes. Spiders."

Spiders, Dykstra thought. *That's how Richard Michaels first described them. As unfathomable as spiders.*

The discussion continued for some time, all put in their two cents worth, but it was clear soon enough that the only thing they could think of to do was to introduce Sammi's genanites into as many of the lead ships as possible and hope that word of the hideous effects got back to the other ships, and they turned tail.

"The genano agent is ready," Sammi said. "As ready as Andy and I could make it." Andy had actually managed to become quite helpful of late. "But how do we introduce it into their ships?"

Very softly, but before any of the other military men present could respond, Nikki said, "Wirasinghe Maneuver."

"Which is?"

Bob filled Sammi in. "Shortly after Dykstra shields were developed, a pilot named Sulari Wirasinghe figured out that if she let her shield overlap her adversary's, the shields would nullify at the interface and she could fire through the resulting gap. Our airdams work on the same principle—that's why a ship can pass through without any air escaping."

"Of course, once word got out, shields were redesigned to either hop frequency or strobe. Anyone trying it today would be committing suicide," Knoedler added.

"Except that Phinon shield units are not capable of frequency shifting," Dykstra said. "Another of those obvious things they never developed."

"Shields but not artificial gravity?" Wayne asked. "But they're just variations of the same thing."

Dykstra shrugged.

"But won't the Phinons be able to shoot back through the same opening?" Sammi pursued.

"Probably," Knoedler said. "We'll need a ship to engage each targeted Phinon craft, and a piggyback skiff to perform the Wirasinghe Maneuver and pop a biomine loaded with your bugs through the hole. For most of the skiff pilots, it likely *will* be a suicide mission."

After very little more discussion, it was agreed with sickening finality that this was to be their plan.

"Thank you, everyone," Knoedler said. "I'll inform my superiors of our decision, and put out a call for volunteers to pilot the skiffs."

"Who's going to volunteer for that?" Sammi mused out loud.

"I am," Nikki said.

Dykstra heard, then glanced over at Knoedler. The colonel didn't seem to have been listening.

So, you're going to tell the Joint Command of our plan, Colonel. But are they aware of yours? Dykstra wondered.

The meeting broke up and Dykstra made his way over to Wayne Vander Kam, gestured that he wanted to talk to the man alone, and silently the president of Capitol Products followed him into an adjoining room.

"Wayne, what happened at the black docks after I left?" Dykstra asked. "Why weren't more ships converted over to the new drive?"

Despite the long history between the two men, Vander Kam refused to tell him all he knew. "Chris, I'm only going to tell you three things. First, Knoedler stopped the ship conversions practically the minute you returned to the Moon. Second, an awful lot of stuff is leaving our facilities, *all* of them, and going sunward to Mercury."

He hesitated after that and Dykstra prompted, "That's only two."

"And third . . . Chris, trust Knoedler on this one. He knows what he's doing."

Interlude II

The baby Phinon sure *seemed* like it was curious as it aggressively wandered around the glass tank to which the biology section had confined it. Flitting from side to side and over obstacles of pipes and blocks, the tiny quadruped learned its environment, but the rods and pistons of the limbs made the thing look for all the world like something out of the toy "build a robot insect" kit Sammi had played with as a child.

During the dissection of the first Phinon, as soon as it had died, the researchers had noticed that the "baby" was fighting to escape from the body, primarily by eating its way out. Flesh or steel bone made no difference—its mouth parts secreted a powerful fluid that dissolved anything in the way. Although certain that the escape had been prompted by the death of the "parent," it had been unclear to the witnesses whether or not the baby didn't normally try to leave the adult body this way when it was born. Given the prodigious regenerative powers of the Phinon physiology, they might have been witnessing a typical Phinon joyous moment.

If the Phinons know what joy is. Sometimes I wonder if I even know anymore. Sammi continued to watch the baby Phinon, but she was mentally adrift, not quite knowing what to think, not quite knowing what to do with herself. She was a bit disgusted with herself for finding the baby alien "cute," given what its species was about to do to her own race, but it could hardly be blamed for that.

The meeting had only been that morning, but somehow she couldn't accept the idea that her work was all done. She had promised Knoedler that she'd "whip up her best batch" of genanites by tomorrow for loading into the biomines, but even that was really nothing more than a few keystrokes on her keyboard. There was no further tweaking to be done, although she could do some if she wanted to. Make the Phinons turn blue before they die? That was a trivial DNA side attachment. Make the Phinons die even faster? Could be done, but not worth the effort.

Put in a self-destruct code so the genanites don't go on killing forever?

That was the question plaguing her, and it had been for months, though she wouldn't admit it to herself. It had been fun playing revenge fantasies through her mind in the months since Steve had died, but she'd been avoiding the real question, and now she couldn't anymore.

Sammi left the baby Phinon to its investigations. Had she been free to leave the High Command, she might have gone back to Luna City. Or maybe to the cemetery. But she couldn't go. She was too valuable for Knoedler to risk her leaving the safety of the complex, at least until the attack fleet was away. She went to the one place where she always went to think at the High Command—the observation bubble.

This time the view looked threatening. Out there somewhere was the Phinon fleet, turning toward the Earth-Luna system. If her bugs didn't prompt them to flee, then the Earth was lost. But even if the Phinons destroyed the Earth, the Phinons were dead in the ultimate Pyrrhic victory.

The Earth was so beautiful hanging there in the diamond-dusted velvet of the sky, but Sammi couldn't help but overlap the view with images from the destruction of the Jovian worlds. Live in tunnels until we could defeat the Phinons? Fat chance. There weren't going to be any tunnels left anywhere down there if the Phinons had their way about it. But win or lose, the Phinons would die anyway, and she recalled the holotank image of the galaxy going dark that she'd set up to amuse herself.

Somehow, it doesn't seem as satisfying now. Five thousand years from now, on some planet . . . or rather, in some comet . . . on the other side of the galaxy, the last Phinon is going to collapse as its bones rust away. And it will never know why. And it will never know that I did it, nor that it was the last victim of a long-ago war, nor what the outcome was.

It was all so desperate and romantic and tragic. *And real—don't forget that!* Again she looked out at the stars, and wondered which if any of those she could see was Alpha Centauri, which Tau Ceti, which Epsilon Eridani. Three passenger ships equipped with the hyperdrive would be heading for those stars before the Phinon wave arrived. It would take over two months for the first ship to arrive at Alpha Centauri, and it was certain that the Phinons would occupy the Oort cloud of that star. Given Dykstra's understanding of the Phinon evolution, the time scale almost mandated that they had the entire galaxy filled up by now.

No place to run but to isolated islands inside Hague Limits, hoping the Phinons won't notice them so they can keep humanity going. And maybe even come back to rebuild here. That too was romantic and tragic.

Sammi heard the door slide open behind her. She was certain it had to be Chris. Who else would come up here at a time like this? But when she turned to look she was surprised to see that it was Paula who was entering the observation bubble.

Oh no, not Miss Bouncy-wouncy, Sammi thought. Even as she thought it she knew she was being unfair for she didn't know anything about the girl and, although they'd been introduced, had never even had a conversation with her. The flow of Paula's figure was the only thing Sammi was basing her opinion of the woman on, and she rather liked assuming that Paula was better defined by her body than her brains.

"Oh, hi," Paula said, noticing her. "Rick said I should come up here some time. I hope I'm not disturbing you."

"You're not," Sammi assured her. "I just came up here to look at the stars and sort some things out."

"That's why I came, too," Paula said. She walked to the side of the dome and peered out into the deep.

"Hard to believe this may be one of the last times any of us ever see Earth."

"Yeah," Sammi said.

"Rick sometimes calls you `Sunshine.' May I ask how you got the nickname?"

Isn't it obvious, you . . . Sammi thought, then stopped herself. *Is it obvious? Do I even smile anymore? I used to be fun. I used to be spontaneous. What happened to the person who had that nickname, anyway? Even Chris hardly calls me "Sunshine" anymore.* "I got it for my smile. But I haven't been smiling much lately."

"I can understand that," Paula said. "I should be deliriously happy myself. I love Rick Vander Kam. Did you know that? He's everything I've ever wanted in man, and I knew it instantly. I know, some people think I'm only after him for his money. I can understand why they would. But I don't care. I really don't."

"Is that what you came here to think about?" Sammi asked. She also had wondered about Paula's motives with respect to Rick, but for now she figured listening to Paula would take her mind off her own thoughts.

"That and other things. He told me a little while ago about what was decided at that meeting you were all at. And about the call for volunteers . . ." Paula turned away from her and resumed looking at the sky.

"You're going to volunteer to pilot a skiff? What did Rick say?"

"I haven't told him yet. But what else am I supposed to do? I'm a good pilot. Am I just supposed to sit on my hands while the Phinons try to kill us? Either your genanites turn them aside or they don't. I've never been one to just sit around and wait to see what happens—Rick could tell you that. The least I can do is try to deliver them to target."

And now we're back to my bugs, Sammi thought sadly. *So much for a change of subject. What am I doing up here? Looking for the girl who used to be? Looking for Sunshine MacTavish? Sunshine never had the fate of humanity resting on her shoulders.*

"So how does it feel to have the fate of the Phinons resting on your shoulders?" Paula asked, interrupting Sammi's thought. "The way Rick told me, if we can infect them, even if they don't flee, they're dead."

The fate of the Phinons?

"Didn't you mean to say the fate of humanity?"

"I'd say that's on a lot of shoulders. Even mine once I volunteer," Paula answered. "Where would we be

without you or Dykstra or Arie or my Rick?

"Oh, how am I going to tell him?"

It was clear to Sammi that Paula had not thought too deeply about the implications of what she'd said, but just saying it had been enough. What had Chris said, practically at the beginning? *That our actions will be judged before God and history. I know what I've been planning to do. But what would Sunshine do?*

Sammi left Paula to bounce her thoughts off the stars and took the elevator down. She wandered the halls a while, then found herself drawn to the lowest floors, all the way down to the Phinon cage. Although the floor of the theater had been scrubbed, she was sure she could still detect the sour smell of vomit.

She shuddered as she recalled the Phinon dying. She wondered what it had been thinking about just before it died. Its mate had been taken away. Maybe it had been wondering about him. Steve had been thinking about her just before he . . .

Without any warning at all, she felt the tears flow into her eyes, then somehow she was sitting on the floor, leaning against the wall and sobbing uncontrollably. At Martha's she had expected to do some crying, and now as she wailed into the empty tunnel, a part of her mocked her for fooling herself. That had been no catharsis—she'd lied to Martha even as she was leaving her place.

Sunshine would not have done that.

But this time Sammi had not been ready. This time the numbed soul inside her would not stay numbed. This time the throat of the black hole she'd been funneling her feelings down choked on the overload of emotions too long ignored, and the resulting explosion of grief left behind a naked singularity.

From which could emerge whichever Samantha MacTavish she allowed.

She picked herself up off the floor, found her way to the restroom and cleaned herself up, and took the elevator back up. The door opened and she almost collided with someone as she stepped out. "Oh, sorry—" She felt a hand on her shoulder. "Bob. I didn't know it was you."

"That's okay, Sammi. By the way, are you okay?" he asked, smiling at his little rhyme.

Why don't you call me "Sunshine" anymore? "I guess," Sammi said. "I still have to go process a fresh batch of genanites for the mines. I don't want Andy to have to do it alone. And he's got to pack. He's going on the ship to Alpha Centauri with copies of the records of our work.

"It's impossible, but I wish I could forget about the whole damn Phinon business for even just one

moment."

"Maybe there's something I can do about that," Nachtegall said.

"Maybe there is, Bob." She stared at him for a few seconds, taking in his noble face and golden hair, then put her arms around him and kissed him in a way she had kissed no one since Steve had left for the Patrol.

Upon resurfacing, Bob said, "I was actually thinking more of dinner and a show"

"No. That's okay," Sammi said. "That was the moment I needed. Thank you. But I have things I have to do now."

She left him standing there, flabbergasted, and walked away thinking, *Sunshine is back*.

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XIV

Lieutenant Robert Nachteggall looked out across the underground acres of the High Command space docks and, though he'd seen the vast array of ships many times in the last several days, he still marveled at the number. There were streakbombers and fighters from the System Patrol, equivalent craft from the Belt, and also from the Belt, ancient but upgraded Hawk- and Mosquito-class ships that no doubt dated from the days of the War of Independence. In all there were over 200 ships occupying space in the docks, and of those, 134 that would actually engage the Phinon fleet, half of them mated skiffs.

Bob would pilot a streakbomber, yet again. He'd been given the lead ship. But it wasn't clear that meant anything more than that his ship would be the first to leave. And flying along with him would be Paula to pilot the skiff. He knew that she'd had a tremendous fight with Rick over her volunteering for such hazardous duty. *Of course, given the situation, staying home in bed is just about as hazardous*, he thought.

The ships would be leaving in less than two hours. Bob was already wearing his flight suit, but plenty of people had turned out to see them all off, and it was time to say his good-byes.

He spotted a group of oddly outfitted men, and decided they must be pilots from the Belt. Then he noticed that one of them was Reggie Dukes. Their nemesis from Jupiter had turned out to be an all-right kind of guy after all, and Bob was proud that his instinct to let the man board had worked out well—Reggie had volunteered for skiff duty.

Someone clapped him on the shoulder from behind. Bob turned. The face was familiar, but . . . oh! "Captain Brinn. Of course. I heard you were on Luna."

"Not long now, Lieutenant," Brinn said. "Good luck."

"It's not long for you either I hear. Your liner breaks orbit only a few hours after the fleet leaves," Bob said.

"That's right. I'll survive this thing regardless. Somehow that isn't all that comforting," Brinn said. "But I hear Tau Ceti is nice this time of year."

Of the three spaceliners that had been outfitted with hyperdrives, Captain Brinn had been selected to command the ship headed for Tau Ceti. The liner would take along her usual crew, but filling the passenger slots would be scientists from both the Mars Terraforming Project and the Phinon Project, their families, and then others selected by lottery from Luna City.

If Bob's group was successful, then Brinn and his crew would still perform a valuable survey. If Bob's

group failed. . . . At any rate, they'd be trans-Hague Limit and in hyperspace before the engagement with the Phinons took place. If no one from Earth showed up within a week of their arrival at Tau Ceti, they'd know there was no point in going back.

Bob noticed Sammi talking to an older couple near the dock entry doors. The woman was rather large and soft looking, and Bob decided she must be Sammi's friend Martha. Brinn moved on, but Bob was hesitant to go over and talk to Sammi. Despite the kiss in the hallway, that very evening he'd tried to contact her, but failed. This was the first he'd seen her since then. But then the decision was taken away from him for Sammi spotted him herself, flashed her famous smile—*How long has it been since I've seen that?*—and waved for him to join them.

Sammi looked beautiful, as finely finished as he hadn't seen her since the day he had taken her to meet Chris for the first time. Something had changed inside her recently, he decided, and she was becoming her old self again. "Martha and Ted, this is Lieutenant Robert Nachtegall," she said as he joined them. "I've told you about Martha, Bob. We worked together on the Mars Terraforming Project. Ted is her husband," Sammi said, making introductions.

Ted just nodded but Martha said, "It's nice to finally meet you, Lieutenant. Sunshine has told me a lot about you. Too bad the circumstances couldn't be brighter."

Bob just shrugged and smiled. "But that's out of our hands, I'm afraid. But Sammi, why don't you go along on the liner? You still can, you know. You belonged to both Projects."

"You're not getting rid of me that easily," Sammi said, but if she had anything to add after that she didn't get a chance to say it because two other men suddenly called to her.

"Samantha! Hey, it's us, Mike and Terry." The two came over and each gave her a warm hug. After some chatter Sammi finally got around to introducing Bob.

"Mike and Terry were Steve's best friends," she said. "They were all suicide orbiteers together."

"That's right," Mike said. "And by the way, Sammi, thanks for sending that post along about how Steve really died. I'm glad we finally got to know the truth." Sammi had written down the account and sent it to all whom she thought would want to know once the secrecy about the Phinons was lifted.

"I wanted everyone to know," she said. "But what are you guys doing here anyway?"

"Lotto winners," Terry said. "Both of us. Must be fate."

A klaxon sounded and Ted gave Martha a nudge. "That's for us, dear. The shuttle up to our liner. We'd better get moving." There were some more hurried good-byes and farewells, more hugs and some kisses, and then after a few moments, just Bob and Sammi standing together.

"Where are the others?" Sammi asked. "Chris? Rick? Nikki? And how has she been lately?"

"Chris and Rick should be along soon. Nikki was still depressed last I saw her. She wanted to volunteer for skiff duty. But Knoedler wouldn't let her and said he needed her to come with him to Mercury. God only knows why. Even Chris doesn't know. But the colonel apparently has at least one other card up his sleeve. Either that or he suddenly turned coward."

"You don't *believe* that?"

"Nah. Not the colonel. Anyway, Nikki was spitting flames when they left yesterday. That by itself may have been the best thing for her," Bob said. Then he spotted their friends across the dock and waved. "There's Rick and Paula," he said.

The two watched as Rick and Paula, holding hands, made their way around and over the cables and equipment snaking through and cluttering the docks. "How did Rick take it when Paula said she was going to volunteer as skiff pilot?"

"You knew about that? Rick went through the roof but he didn't have an adequate argument to change her mind. Then I suppose she batted her eyes and a few other things and he shut up about it."

"I'm sorry I ever called her 'Miss Bouncy-wouncy,'" Sammi said. "I don't think I could have volunteered for that job."

"Sammi. Hi!" Rick said. "I'm glad you're staying at the High Command."

"I had some good-byes to say. And even though my work is done, where else was I going to watch from? I hear you did volunteer, Paula."

"Nothing like looking at the stars to clear your thinking," Paula replied. Bob didn't know what the two women were referring to, and he didn't ask.

Then Rick asked earnestly, "She's going with *you*, right, Bob? Paula is riding out in your ship?"

Sammi raised an eyebrow at that, Bob noticed, and he smiled inside. "That's right. I owe you, Rick. You saved my ass. I'll do my best to keep Paula's out of trouble."

"Well, what a fine couple of cavemen you two are," Paula observed. "Samantha, will you make sure Rick doesn't hurt himself while I'm gone?"

"Why certainly," Sammi said, picking up the jest. "And I'll make sure he eats well and dresses himself

properly, too."

"I've never found gallows humor funny," Rick said, but then he put his arm around Paula and held her to him tight.

They were all quiet for a moment, not knowing what else to say, when Sammi spotted the one man most dear to them all. "There's Chris," she said.

Dykstra was standing by the entrance to the docks, walking stick held firmly, solidly planted on the floor just in front of him. Bob remembered how Dykstra had looked in his apartment all those months ago when he'd sent them off on their illegal mission to capture some Phinons. Like a king at court, he'd looked then, confident that his cause was just and his views the right ones. Bob wondered what the old genius was thinking at this moment, for the activity at the docks would not be taking place right now had it not been for him. Nor would there have been any hope for survival from the approaching onslaught had the great man not been with them.

And Bob remembered the morning when he'd picked Dykstra up at his home in the mountains and whisked him here to the High Command, recalled the struggles they'd gone through together against the small-mindedness of Major Moore, the triumph of Dykstra when he'd puzzled out the workings of the Phinon hyperdrive, the joy in the man as he'd helped assemble the *Hyperlight* at the Capitol Products black docks.

This is Dykstra's war, Bob thought. Without him, there would have been no war, just a few months of extermination.

Dykstra spotted Sammi's wave and strode over to them. "My friends," he said. "We've come a long way these past months, haven't we?"

"A long way we could not have come without you," Rick said. "You're the whole reason we're all here now," he continued, Rick's words paralleling Bob's thoughts. "Without the hyperdrive, and the new drive, and your understanding of the Phinons, we'd just be ducks in a pond, waiting for the buckshot."

"But we still don't know if it's enough, Rick. Don't forget that," Dykstra said.

"He's right though, Chris. Without you, we'd be witnessing the end of humanity right now," Sammi chimed in.

"You're all embarrassing me," he said. "Without all of *you*, without your faith and courage, despite anything I could do we'd still all be dead. Strip away all the technology, all the fancy gadgets and brilliant strategies. In the end what will save us are our best qualities, our self-sacrificing, our love for each other. These are things about which the Phinons know nothing. I want you all to remember that these next few days.

"Now, may I see your ship, Lieutenant?"

"Certainly," Bob said, and they all started walking toward the berth where the ship that Bob and Paula would take to their battle stood waiting.

"By the way, where's Arie?" Sammi asked.

"Ah, our little friend has had his own little enclave built for him in the tracking room, courtesy of the colonel. He'll be able to listen to the Phinon chatter quite comfortably there. I just left him there a few minutes ago. He was, er, customizing his environment."

"`Customizing'?" Bob asked.

"Installing a squirrel cage, oh yes," Dykstra said.

They arrived at the berth. Emblazoned across the bow of the streakbomber was the name *Hyperlight II*. "I figured I'd better stick with a winner," Bob told them.

"I can't tell from here," Dykstra said, looking up at the skiff attached to the top of the bigger ship. "Did you also get to name your ship, Paula?"

"*Pops*," she said.

"He'd like that," Bob said.

Another klaxon sounded, this one keener and shriller, and it was the signal for the pilots to report to their ships. As if taking it as his cue, Dykstra said, "This time the only words I have for any of you is, `See you later.' " With that he walked away.

Rick and Paula wandered around to the other side of the ship to say good-bye, and Bob was left with Sammi beside him. Bob found himself at a loss for anything to say, and was actually wondering if this time he was going to get another kiss or maybe just a punch on the shoulder. *At least she's here*, he thought.

"I have not been fair to you, Robert," Sammi said, and she put her arms loosely upon his shoulders, lightly clasping her hands behind his neck. Reflexively he put his hands around her waist. "We have a lot to talk about when you return."

"Sammi, you don't owe me any explanations, any apologies," Bob said.

"I may owe the entire human race an apology when you get back," she said.

"I'm sure your genanites will work."

"So am I."

"Then I don't understand—" he began, but she put her finger to his lips. Then she pulled him closer and kissed him in a way that put even the hallway encounter to shame.

Rick and Paula had been waiting for them to finish, Bob realized, as his lips broke from Sammi's. Then there were a few hugs and some handshakes, and Sammi and Rick walked out of the docks, and he and Paula watched them go.

"Poke yourself in the eye, Bob?" Paula asked. "They're looking a little moist."

He didn't answer, just turned and walked up the ramp into the *Hyperlight II*.

* * *

Twelve hours after the last of the fleet had departed the docks, Dykstra returned there, and walked slowly across the empty floor. Cane in hand, he headed for the laboratory they'd constructed for him in a corner of the expanse when the alien drive unit had been brought to Luna from the battle at Slingshot. It was still there, or at least parts of it, still clinging to the inside of the crumpled shell. The unit had no more secrets to offer up, but Dykstra wanted to see it again for it reminded him of a time only months yet forever ago when he knew his work meant something.

He knew it was silly, but he still felt guilty about how little "real" work he'd done since returning from Earth. He'd made some progress on the problem of transmitting radio signals FTL from a stationary source outside the Hague Limit, and could probably have had a working model ready to test by now if he'd only been free of the constant interruptions that had come after his return.

But then, they *were* important interruptions.

And then there was the entire theory of hyperdrive and hyperphysics to work out rigorously. So much of what had so far been accomplished still existed only in his head. He really had to get it down into some more permanent, yet intelligible to ordinary minds, form. For hyperphysics had turned out to be more than just a "few new wrinkles" in Dykstra Field Theory—he could see that now. At the turn of the 20th century, relativity and quantum mechanics had overturned the views of the 19th century, and even Maxwell's work had been modified. To be noted, though, were the objections of that incomprehensible genius Tesla, who thought everyone had gone off on the wrong track. By the turn of the 21st century, Tesla's concerns had been borne out. The work of Kirk, Spencer, and Phipps had turned up anomalies in both electromagnetism and gravitational theory, and it had been left to Dykstra to sort it all out and

introduce the new paradigm that would rule physics through the century.

But I never thought I'd have to do it all again at the dawn of the 22nd century, Dykstra thought. Yes, so much work to do. Or that could be done, if there was a point to it.

Upon entering the lab, his gaze turned to the crumpled can that was the shell of the Phinon hyperdrive motor; a motor he now knew was not the product of genius, but of a billion years of evolution. "Lucky for us I figured out your secrets in a few months," he told the motor, but it seemed unimpressed. The lab had been stripped of equipment months ago, a shell now as hollow as the motor itself, and Dykstra stayed there only a few minutes.

Back out on the floor of the docks, he looked across past the rows of empty berths to the few craft that still remained, though they were only shuttles and hoppers for point-to-point trips on the Moon. All of the ships were gone, the closest evidence of the great Exodus from Earth that had taken place much the same way as the desertion of Jupiter had. But this time it was clear that fleeing to other planets was hardly a guarantee of safety. Most ships headed for the Belt, the one place it would take the Phinons a long time to clean out, but also a place where few of the refugees would be able to hold out. It took the right kind of equipment to sustain life on a rock.

As he walked toward the shuttles (for no reason other than that they were there), Dykstra's mind again turned toward work. Since his stay in the hospital, he had confirmed in his mind that his best idea for a super weapon—*more like a Doomsday weapon*—would work. This was something best characterized as a "Dykstra field Tesla coil" sort of thing which could be made large enough to cause the Hague Limit to expand and contract in resonance with it.

He could make the sun explode that way.

That would hardly help us now though, would it? Still, he could envision some future where detonating stars might be useful for cleaning Phinons out of the surrounding Oort clouds.

Or other humans out of star systems.

Even if we survive the Phinons, can we survive human nature? Still, surviving means that Samantha's genanites will have done their job, so we may never have to face Phinons ever again. Come to think of it, as long as we infect them, even if humanity dies out, at least their "reign of terror" in the galaxy will come to an end. Maybe then some other race will have a chance to inherit the stars. He thought about all those conjectured civilizations (when he was a boy it had been assumed there were millions of them) that might have made it to the stars, only to be cut to pieces just as they were taking their first steps.

The nature of the Phinons had finally explained the Fermi Paradox.

* * *

"Paula, it's showtime," Bob said. Without a word she got up from the copilot's seat and went into the middeck. She suited up and then climbed through the special docking ring that allowed passage into the mated skiff. Only after she was in place did she say anything.

"Ready, Lieutenant. Bring us up close."

It had been a quiet flight for the two of them, and probably for most of the pairs in the other streakbombers. The ships had taken a day and a half to fly out and turn back so that they could come up on the lead ships of the Phinon fleet from behind. During the trip, both Bob and Paula had been lost in their own thoughts except for those times when they had to look over the data feeds they were getting from Luna and the observation and tracking ships.

After Jupiter, the Phinon fleet had gradually turned around in a large arc and the ships were now headed toward Earth from high above the ecliptic. Bob and Paula were encountering them less than an astronomical unit from Earth. Bob's streakbomber was one of those ships equipped with the new drive immediately following Dykstra's confrontational meeting with Knoedler. Paula's skiff was powered only by a standard fusion drive—there had not been time to convert the skiffs over. Still, if all went according to plan, her fusion engine would be enough.

"We'll be right alongside our target in three minutes," Bob said. He was looking at the Phinon ship out the bubble, her image shimmering slightly from the effects of the Dykstra shield surrounding the *Hyperlight II*. The ship was an ugly, evil-looking thing, bulbous with odd curves and sharp projections sticking out. The expeditionary force that had encountered the fleet before it went to Jupiter had found that the Phinons did not fire until fired upon, and would not break ranks no matter what. As Bob pulled alongside, matching velocity only a few hundred meters away from the alien ship, he could almost feel a reflex in his hand trying to reach for the fire button on the weapons array. *Yeah, I could kill this one. His shields aren't even up yet. Then what? Only another million plus to go.*

"You're on, Paula."

He felt a slight nudge and heard a faint clang as the skiff separated from the *Hyperlight II*. Slowly, Paula closed with the Phinon ship. She was less than a hundred meters away before the alien vessel turned on its shields. "Well, I really didn't think they'd leave them off the whole time," Paula radioed back. "That would have been too easy."

The *Pops* continued toward the ship.

Bob switched radio channels for a moment, listening to the Phinon ship-to-ship. They were talking up a storm. *I wonder what they're saying, he thought. Too bad the only translator is light-minutes away. She'll be back before Arie could tell me what they're talking about.*

"Fine-tuning to Phinon shield frequency now," Paula said, her voice breaking through the Phinon chatter since her frequency had priority.

Bob watched. This was the worst part. There was a shimmering ring around the interface of the two shields as Paula eased the *Pops* through.

"I'm in!" she said. "How are we coordinated with the others?"

It took Bob thirty seconds to find out. It was important that all the ships perform the Wirasinghe Maneuver near simultaneously lest the Phinons talk to each other. Though the Phinon ships had yet to respond to them, no one, Bob included, thought this would continue once the first biomine was detonated. "Eighty percent of us are in position," Bob told her. "I'm waiting for the coordinating signal. There! Twelve seconds, mark."

Twelve seconds later, like a wasp streaking in for a sting, the *Pops* dove for the Phinon ship, engine flaring, tractor beams on. It took only seconds to attach, place the mine, then spring back off, engine flaring again.

"Did it, dammit!" Paula cried.

Bob saw three flashes. The first was the blaze from Paula's drive. The second was the explosion of the biomine on the hull of the Phinon ship.

The third was the brilliant glare from the X-ray laser that suddenly lanced up from the Phinon craft and hit the *Pops*.

* * *

"They know our ships are there, oh yes," Hague said. His listening post was getting direct feeds from an observation craft less than a light-minute from the attack, but it still required more than four more minutes for the information to make it to the Moon. With all the Phinon ships communicating at once, it was necessary for the observation craft to pick and choose which to listen to.

Hague was just reporting the gist.

"Well, if there was such a thing as absolute time, I could say our skiffs should be attaching their mines right about now," said some officer Dykstra couldn't pick out down on the floor of the tracking center. He, Rick, and Sammi were watching near Hague's station, from the elevated deck that half circled the room.

But we do have absolute time, now, Dykstra thought. He really did have to get started on a hyperphysics text. *Well, maybe I can wait another few hours, when we find out if the Earth is still going to be here.*

"I hate this," Sammi said. "I hate this waiting." She was holding onto the rail, hard. Dykstra noticed her white knuckles.

"Me, too," Rick said. "Arie, are any of them talking about using weapons?" Because of his relationship with the savant, Rick was the one designated to interface between Hague and the High Command officers.

"Oh no," he answered. "No, no, not at all. No one has fired on them. They're unconcerned. Yes, unconcerned, oh yes."

"Bet they won't be when the first mine goes off," Rick said.

* * *

"Paula! Paula! Paula!" Bob screamed into the comm. His hands played over the weapons board. He had the lasers at full and the weapons array ready to deal destruction. He could see the *Pops*. She was tumbling but still in one piece—the skiff's Dykstra shields had held against the laser strike.

Mostly held.

"Still breathing," Paula said, though it sounded to Bob like she was out of breath. "Shields held. Still tuned . . . slipped right through their . . . sonavabitchen . . . shields. Engine's dead . . . though."

"I'll get them!" Bob said and his hand reached to fire. And stopped.

I can't. Dammit! I can't. They need to be infected and . . . Shit! Instead he maneuvered the *Hyperlight II* between the skiff and the Phinon ship. They hadn't fired again, not since the one shot at Paula. But this way, Bob's ship would shadow Paula's in case they did resume firing.

Even then, he couldn't shoot back.

"Paula, what kind of shape are you in?"

"Rick never . . . had any . . . complaints."

"Shit. What's your physical condition, I mean." Still, he couldn't help smiling at her grit.

"I just took a . . . blow to my tummy when . . . the laser hit. Knocked the . . . wind out."

"Okay. I'm going to lock the skiff to my bow with the docking tractor. Think you can stand two gees for

a while?"

"Yes."

Slowly, slowly, Bob brought the *Hyperlight II* close to the tumbling skiff. He kept one eye on his rear monitor, praying that the Phinon ship behind him would continue its docile ways. "Turn off your shields, Paula." She did. The docking tractor consisted of two collimated but independent beams. Bob's ship's computer rapidly figured out how to use them to slow the tumbling of the *Pops*.

"Great. You're stabilized. Put your shields back up and tune to mine."

There was a delay. "Paula?"

"Damn things won't go back on."

* * *

"The mines have gone off, oh yes," Hague reported.

"Confirmed. Thirty-eight of the skiffs were able to get their mines in place and detonated," came another announcement over the PA.

"Oh no, oh no. The spiders are mad, oh yes. Going to attack now, oh yes. Oh no."

"Reports of X-ray laser fire coming from multiple sites."

"I *hate* this," Sammi said.

* * *

"I'm getting a report that some of the other Phinon ships *are* firing," Bob told Paula. "But if I'm going to save you, I have to drop my shields for a few seconds and let you in. Stand by."

"Can I be valiant and suggest you leave me behind?"

"Sure. Ain't going to do it, though. I'm closing at one meter per second. Ready. Set. Shields down!" It would take six seconds. He counted them in his head. He was up to four the second time when the ship turned the shields back on at the proper instant.

BAM! A Phinon missile slammed into the *Hyperlight II* on the port side.

"Shee-it! Where did that come from? Paula, you okay?"

"Yes. And damn lucky. Let's cut a trail, Bob. Now."

"Have to get the skiff secured first. Looks like that missile came from one of the ships back in the pack. Don't see any more incoming. *Our* Phinon still hasn't done anything. Okay, we're mated. Two gees till we're safe," he said, running the drive up even as he was speaking. "We'll get you back aboard once we're a safe distance away."

"Are there any reports yet about Phinon ships turning aside?" Paula asked, an extra hint of strain in her voice. Two gees after being hurt was no picnic.

"Not yet," Bob told her.

"Then there is no safe distance away."

* * *

"Arie, are the bugs working? Are they talking about it? What's going on?" Sammi finally burst out.

Dykstra put his hand on her shoulder. "They may not say anything, Samantha," he said. "The unaffected ones in each ship might simply stand frozen while they watch the others die. We didn't have another Phinon handy to watch at your demonstration."

"I know, Chris. I'm sorry. It's just . . ."

"I know," he said.

* * *

"Bob? I lied. I'm not in good shape at all." They'd only been pulling two gees for a matter of minutes.

"What?" Bob responded. "Dammit, Paula, you're already a goddamn hero. Are you trying for martyr, too?" Bob reduced the acceleration to one gravity. "How is that? Can you hold out?"

"Much better. Thanks. And only time will tell. But just how far away from the fleet do we have to be before you'll feel safe?"

The other side of the galaxy comes to mind, he thought. "The cross-section of the armada is about the same as the diameter of Luna's orbit. They seem to adjust it based on the size of the system they're attacking. I was hoping we could be a full diameter away, but if you're in that bad shape, we could risk

an EVA now. And are you going to be able to come over, or do I have to go and get you? Be honest this time!"

"You'll have to come get me," she said a few moments later. "But I can stand a gee for a couple hours. I think. Any more reports you can fill me in on?"

"There was sporadic laser fire and missile release when the mines were set off. We lost at least ten ships, the monitoring crew says. Hasn't been—"

"Screw that shit!" Paula snapped back. "I set that mine off more than fifteen minutes ago. Half that crew should be bean bag chairs by now. Have *any* of the ships turned *away*?"

* * *

"Message for you from Colonel Knoedler, Dr. Dykstra," the courier said, thrusting a private viewer cube into his hand. "He left instructions that you should scan it immediately."

"Oh. Thank you," Dykstra said. The courier left.

Neither Rick nor Sammi seemed to have noticed that the young man had even been there. They were intent on the main screen, as was everyone else in the room, for any sign that the affected Phinon ships were going to flee. Hague had reported an initial flurry of chatter flying among the attacked ships in the first moments of the release of the genanites, but that spike had decayed to no chatter at all in only moments. "Oh yes, they know they're sick, yes," was what Hague had reported, but nothing else in the last ten minutes.

Dykstra lifted the viewer to his eyes and brushed the "on" stud with his finger, then remembered to put the earpiece in place. A holodisplay of the inner Solar System appeared. An arrow pointed to Mercury. Another pointed to a panoply of bright specks that was the Belt. A thick cream line represented the Phinon attack. An arrow at the bottom pointed in the direction of where Earth-Luna, not shown, would be.

There were a lot of silver lines going from Mercury to the Belt, then making sharp turns and intersecting the Phinon line along much of its length.

Dykstra was distracted by Sammi. "I failed," she said. "It's been long enough. They should be turning. They're still coming. I failed." Rick moved over to her and put his arm around her.

"Ensign, what are all those fast little specks moving up the screen?" Dykstra caught an admiral down on the main floor asking. "Some problem with the screen?"

"No sir," the ensign answered. "The screen is fine. But I don't know what the specks are."

Dykstra returned to the viewer. Knoedler's voice had started a narration. "Chris, remember Slingshot?" he said.

Dykstra tore the viewer away from his eyes and looked at the screen again, then he went to the rail and called down. "Hey! The specks. Ensign, how fast are the specks moving?"

The man looked up, recognized his questioner, turned to the admiral, got a nod and answered. "They're all moving at very high fractions of the speed of light. If they're real, I mean."

Oh, they're real all right. "How many are there?"

"Looks like thousands, no, tens . . . hundreds of thousands," the confused ensign finally answered.

Dykstra reached out a hand and steadied himself against the rail. "Colonel, you brilliant son-of-a-bitch," he said.

Everyone heard.

* * *

"Tommy, looks like ninety-eight percent of the KKV's came through the Belt right on trajectory," Nikki Knoedler said to her new husband. It had been a rush wedding at the only close-to-Christian chapel near the Mercurian north pole, but the colonel had insisted and, depressed or not, Nikki had not forgotten that that was what she had wanted, too. At the moment they were aboard Knoedler's boat, which Nikki had renamed the *Honeymoon* before the craft had been shot out of the cannon at .42c.

That was twenty minutes ago.

The kinetic kill vehicles had gone on before them, thousands at a time, shot out of the cannon in multiple salvos on trajectories that would take them into a huge swath of the Belt. There, close approach orbits past asteroids with high powered tractor beam assists, coupled with the Dykstra-Hague impellers on each vehicle, had boosted their velocities up to over .8c, and bent their courses to intersect the column of the Phinon fleet.

Due to Knoedler's plan, the System Patrol had a scarcity of ships equipped with the new drive, but over 600,000 intelligent rocks to hurl at the alien attackers.

And hurl they had. The *Honeymoon* had followed last, but on a different, direct course to the fleet encounter. There with Nikki piloting, Knoedler himself was doing whatever fine-tuning was needed to maximize their assault.

"Good! Damn good as a matter of fact. God must be on our side," Colonel Tommy replied to his new wife. "Any evidence yet that they're turning aside? If Sammi's genanites don't do it, maybe losing half their fleet will."

"Been over fifteen minutes. Doesn't look like any of the lead ships have changed course," Nikki answered while staring at the scanner.

"Then I guess we have to save the day," Knoedler said. "You may apologize to me again for all the things you said to me when I ordered you to come with me to Mercury, wife."

"I'm sorry, Tommy. Call the High Command now?"

"Chris will have had his advance notice by now," Knoedler said. "It's time to tell the whole System what's about to happen. I mean, `happening.' They'll be seeing the first impacts before our message reaches them."

* * *

"Bob?"

Now what? the lieutenant thought. They'd only been at one gee for five minutes. "Yes?"

"I guess I'm bleeding worse than I thought," Paula said.

"God damn you, Paula!" he roared at her, but he cut the drive to zero. "We'll just coast with the shields up and hope we don't get any concentrated fire. I'm coming to get you. I'm suiting up, *now*."

A soft, "I'm sorry," issued from the speaker, but by then Bob was on the middeck putting on his power suit (upgraded to a deluxe model like Pops had worn). Bob was out the airlock and standing on the bow with his gripfields in less than a minute, and looking into Paula's skiff in less than two.

She looked like hell.

Somehow her seat had gotten crushed up against the control console, with her sandwiched in between. "You can't even get your suit helmet on, can you?" he observed.

"Maybe if I could feel my arms," she said.

That she hadn't died from the blast that disabled the skiff was a major miracle. That she hadn't died when they were under two gees was another minor one.

"Shit. I'm going to have to carry the skiff back to the docking ring so we can keep you under atmosphere, then cut you out once I'm back inside. We won't be able to use the drive though because you'll still be outside the compensation fields."

Through his comm he ordered the ship to deactivate the tractor beams, then grabbed the skiff and started the slow walk over the top of the *Hyperlight II* to the docking ring.

Bob thought he saw a brief spark of light out the corner of his eye off the port side. He looked that way and saw another. And another. "Paula, can you see out, toward where the Phinons are?"

"Yes. What are those flashes?"

"Beats me. But . . . shit. Looks like their ships are self-destructing. Maybe they're doing that instead of turning. Paula! I think we did it!" Too many sparkles and flashes were going off by now to even hope to count.

Looks like the end of a burning fuse, Bob thought.

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XV

"Chris, what's the colonel trying to pull?" Rick asked. He'd left Hague to continue monitoring the Phinons alone—not a word had come out of the genanite-exposed ships for some minutes now; those were the ones that Hague was focusing on. Hague continued to listen, headset on, cable getting tangled as he walked around his squirrel cage slipping nuts to Sarobi, Sammi, and Bixy.

"Colonel Knoedler took the basic design perfected at Slingshot by"—Dykstra nodded to Sammi—"Steve MacTavish and his crew, and added small versions of the new drive to each kinetic kill vehicle. With mass converters for power, they're orders of magnitude better than they would have been."

"But why all the secrecy?" Sammi wanted to know. "I thought my bugs were our only hope, and here Knoedler's had this in the works all along."

"Several reasons," Dykstra replied. "Recall the original purpose for the KKV's—to destroy military assets in the Belt. Had they discovered what he was doing, some elements in power there would not have been willing to lay down arms and make common cause against the Phinons. They wouldn't trust us, because these really are now a weapon that the Union could use to clean out the Belt for good. Also, look at the trajectories. The KKV's were shot out of the cannon on Mercury." At this Sammi drew a blank, but Rick understood. "But they're coming from a wide arc of the Belt. This way they can double their velocity doing close approaches, and it also has the advantage of the KKV's not initially heading straight for the fleet just in case the Phinons could spot them. But how do you think the BDF would have responded if they'd seen several hundred thousand projectiles coming at them at forty percent of light speed? They would have thought we were attacking them. They probably don't even know yet what just went through the Belt to disrupt all those asteroid orbits they're likely noticing about now."

The specks on the screen were nearly to the Phinon column; they all fixed their attentions on the scene. The KKV's ignored the first hundred or so Phinon craft. Many of these were the infected ones, and Knoedler had not wanted them to be targeted. But immediately following, Phinon ships were starting to die.

They winked out, one after another, in a pattern reminiscent of popping popcorn—first a few kernels pop, then more and more until there's just one continual sound. Within seconds the occupants of the tracking room were witnessing the same "burning fuse" of sparks that Bob had described, only he'd seen it minutes earlier.

"Message incoming from Colonel Thomas Knoedler," suddenly blared out on the PA, unusual that, but no doubt planned by Knoedler and his superiors. His message also followed, except it was Nikki who was talking.

"This is Lieutenant Commander Nikki Knoedler of the System Patrol ship *Honeymoon*," they heard. "So, she landed him," Rick and Dykstra heard Sammi comment under her breath. "You are witnessing the interception of the Phinon fleet by a salvo of 630 thousand kinetic kill vehicles. We anticipate and expect the destruction of fully half of the enemy fleet. . . ."

The rest of the message went on to discuss what Dykstra had already told the others, and Nikki included a formal apology to the Belt for keeping them in the dark.

"Half their fleet," Rick said. "Pretty damn good. But we're still going to have to hope they decide to flee."

It had taken less than half the fleet to destroy the Jovian system.

* * *

"Wow, look at 'em go!" Bob exclaimed as the sparkler of dying Phinon ships continued.

"Yes. Very . . . pret . . . ty," Paula agreed. It sounded like she was talking through clenched teeth, so Bob tore his eyes away from the scene and redoubled his efforts to move the skiff back to the docking ring.

He had to go slow. Power suit or not, the skiff was very massive and he couldn't risk losing control of it and damaging the *Hyperlight II*. It also wouldn't do to jerk it around too much and add to Paula's discomfort, though at the moment Bob was so angry at her for holding out on him about her condition that he wouldn't have minded eliciting a few grunts and groans of additional pain.

He carried the skiff along the top spine of the ship, then gently moved it into docking position.

It wouldn't fit.

"Dammit!" he said. "Looks like the ring's been damaged, the female unit on the skiff. I'm going to have to lift you up again and see if I can hammer it back into shape enough to fit."

"What . . . ever," Paula said.

Lifting the skiff again, Bob inspected the ring, and to his relief saw that it had only been dented in on the side, and a few pushes and twists with his powered hand set it back into fairly round shape. He put the skiff back into place. "I'm going back inside now," he told Paula. "I'm going to have to scrounge up some emergency sealant to pack around the docking ring from the inside though, before I can get in there and pull you out. It'll leak otherwise."

This time she just grunted a sort of "uh-huh" and let it go at that.

Before reentering, Bob turned again to look in the direction of the Phinon fleet. The fuse had gone out, he noted, and since he didn't know what the cause had been, he didn't know that the last of the KKV's had done its job. But he had only been looking for a few seconds when he did see something he recognized.

"Oh shit. Oh, man! Thank God Almighty, we did it! Paula, we did it!"

Though from a greater distance away, it was a scene Bob had observed once before, with Rick, out near the Hague Limit.

That of hundreds of thousands of drive flames, all burning brightly at once.

* * *

"Yes, yes, yes, yes, yes, oh yes, oh yes, oh yes!" Hague said, bouncing in his seat, almost unable to contain himself. "Yes, oh yes, oh yes!"

"Arie, what is it? What did you hear?" Rick asked, concern but perhaps a note of hope in his tone. No one had been paying attention to Hague because they were all watching the screen. The last KKV had killed its ship and everyone wondered what would happen next.

"They're going to flee, oh yes, oh yes! Run away, run away! Oh yes, yes, yes!"

Rick turned to the others. "Arie says the Phinons are going to—" he began, but then his eye caught the view on the screen and he just pointed. "Look!"

Sammi and Dykstra turned just as the ensign at the control board leapt out of his seat. "Drive flames! God dammit, those are drive flames!"

The admiral kept a cooler head. "What are their vectors, Ensign? That does make a difference."

"Sorry, sir," Rick heard the ensign say. "I'm on it."

By now everyone on the main floor had moved to prime viewing position of the main screen. Rick, Sammi, and Dykstra were all clutching the rail and leaning over. Dykstra's cane suddenly slipped from where it was leaning against the rail and clattered to the floor. Nobody noticed.

A minute went by where the general buzz of people whispering and hoping and praying was nearly deafening all by itself. Then the ensign said, "Got it, sir. Confirmed. They're accelerating at over nine gees. They're going to miss us!"

And now it was a time for cheers. Sammi threw her arms around Dykstra and kissed him soundly on the lips. Rick threw his arms around the both of them and was surprised, but then amused, to find himself crying. The hell with it. They were all crying, or laughing, or both. Even the admiral down below was saying, "Man! Oh, man! Oh, *man!*"

"Chris, oh God, I can't believe it! I can't believe it!" Sammi cried. "The nightmare is over. We're going to make it!"

"We owe it all to you, Chris!" Rick said. "Good job! Great job!" He knew how inane that sounded—Dykstra's singular brilliance had just been responsible for saving the planet. But what other words were going to be adequate?

"Has anyone thought to send a thank-you to the colonel?" Dykstra suddenly asked. Forgotten in the excitement was that Nikki was still sending them information from the *Honeymoon*. She had been taken off the PA, but Rick was able to switch her message through a separate headset from Hague's station. He was surprised to find that the little genius, though he'd been the first to discover and register delight at the good news, was now intently listening to Phinon chatter again.

Rick held one side of the headset to his ear. Nikki was saying, ". . . will have data on density and expansion characteristics of the debris cloud." Rick smiled at that. Yeah, there'd be one hell of a lot of mangled Phinon hardware falling to Earth for the next few days. Fireball city for watchers in the Northern Hemisphere. She was continuing. "We have confirmed kills on five point five hundred K ships and counting. Many of them never had time to raise their shields. This was a real—" There was a brief burst of static and the link went dead.

"What the hell?" Rick muttered. He looked at the channel indicator: DOWNLINK LOST glowed at him in red letters. "Uh oh," he said. "Chris, I—"

"No, no, no, no, no, oh nooo!" Hague burst out. "Oh, no! They're not all going, not leaving, oh no!"

Dykstra and Sammi heard that and promptly came over. Rick's other news had to wait as they tried to calm down the diminutive scientist enough to explain.

"Yes, some ships with the bugs never relinked, yes, never started talking again, no, oh no," he said, and now he was sobbing.

It did not take long for the news to filter through the crowd, and the tracking center crew went to work to confirm Hague's claim.

Four Phinon ships had not changed course. Four of the ones at the front of the column. Four of the ones that had suffered the ravages of Sammi's genanites. One of those ships would pass close to the Moon. The other three would likely drop their bombs on Earth.

Earth-Luna had been saved from annihilation. But multigigaton bombs are hell on biospheres. Though saved from annihilation, the Earth still faced a global catastrophe.

* * *

The skiff wasn't likely to disconnect from the *Hyperlight II*, Bob decided, but he was certain the docking ring would leak like hell once he opened the inner hatch. For that, he got a can of leak-stopping foam, sprayed up a sphere of the aerogel goop roughly a meter across, then pulled open the hatch. There was a violent hissing but the floating glob moved up to the leaks and soon had filled all the gaps, solidifying into a seal nearly as tough as the hull metal itself. Now they'd have to remove the skiff in a dockyard, but that was okay—the ship had accomplished her mission.

"Have you out in a few minutes," Bob told Paula as he opened the hatch and stuck his head inside.

"Thank God," she said. "I'm feeling . . . really, really woozy." Bob could see a tear in her flight suit and dried blood crusted along the edges of the rip. What her leg looked like inside the suit he didn't want to think about.

He looked around at the interior damage, then dropped back into the ship to retrieve the tool kit. After that it was, fortunately, only a matter of minutes until he had Paula cut free and delivered into the aft stateroom. He rolled the traumabot out of its closet, stripped Paula naked, then stepped back to let the machine's hands and expert system sort out what to do about the girl.

He could hear the radio chiming like crazy in the control bubble. "I'm going to go up front to get that," he told Paula.

"I understand," she said. "It's my looks. But I usually look much better than this when I'm naked. Ask Rick," she said weakly, attempting a smile.

Bob took that as a good sign and went up front.

The call was coming from the High Command.

The *Hyperlight II* was light-minutes away from Luna, so there was no way for Bob to have a back-and-forth conversation. What came over the screen and through the voice channel was the entire account of what had happened since the KKV's hit the Phinons. Bob found himself grinning through most of it, right up until the end when he saw the images and trajectory plots of the four remaining ships.

"Damn. Dammit!" he cursed.

The anonymous narration continued. "Though no communication has been detected from these ships,

minor course correction bursts have been observed. It is assumed the crews are alive and intend to carry out their original mission.

"Your ship is the only one in a position to attempt an intercept."

"Son-of-a-bitch," Bob said.

Along with the exodus from Earth of the citizenry with the means to do so came, later, the exodus of the System Patrol fleet. Those ships needed to attack the Phinons had been the last to depart Earth-Luna. If they failed, there seemed little point in having the remains of the fleet hanging around to be decimated along with the planets. Instead, all ships were sent into the myriad of tiny worldlets that was the Belt, most of them carrying vast quantities of equipment to set up spacedocks to convert over every available ship to mass conversion power and Dykstra-Hague impellers. This included the planetary defenses of the Earth. In an era of cheap artificial gravity, there was no reason to build huge orbital battle stations and not add a powerful propulsion system "just in case." The case had come, and these stations, too, had departed for the Belt. That meant that the only defensive systems left in the Earth-Luna system were the ground installations on the Moon.

Had things gone as planned, Bob would have been whisking his ship out to the Belt right now, too, along with all the others that had attacked the fleet. Paula's plight had slowed them up.

The Moon might be able to take out one or two ships. But not all four, Bob thought. I don't think I can get all of them either. They don't know back there that I have a skiff stuck on the back of my ship.

Bob ran the coordinates and trajectory data of the ships through his navigational computer, then did a scan through the structural data on the construction of the *Hyperlight II*. He had to know what kind of acceleration he could do before the skiff would rip off—it lay outside the effects of his ship's compensation fields. One thing was certain—he didn't have time to cut the skiff away. The Phinon ships would be past the Earth long before he could get there if he took the time to do that.

He ran the data three times, each time giving himself more optimistic assumptions.

There was no way.

"Shit, son-of-a-bitch! The skiff rips off above twenty gees no matter how much wishful thinking I throw at the problem." But there had to be a way. He couldn't believe that they'd turned the Phinon fleet aside, only to have a few ships with huge bombs still manage to kill—what? millions? billions?—on Earth. *That's the problem with atmospheres—they're so damn easy to screw up.*

Bob was running out of time. *Over twenty gees, the skiff rips off . . . Then what? It will open the ship to vacuum. Wait!*

Did it have to open the *whole* ship to vacuum?

He had an idea. He also had another passenger. He raced from the control bubble to the aft stateroom.

Paula still looked like hell, but at least now bandages were covering some of the lower circles of the inferno. She had tubes sticking into her in five different places, and Bob knew from personal experience that at least three of those places hurt no matter what the doctors might say.

"Paula, we got a call from the High Command. Some of the Phinon ships didn't turn away. We're the only ship that can intercept," he told her.

She smiled up at him weakly. "But my skiff is glued on, right?" Even in pain and all banged up, Paula was sharp.

Miss Bouncy-wouncy indeed! Sammi, when I get back I'm going to make you buy this girl dinner. "That's right. But I have an idea. Damn risky, though. I want to seal up your stateroom and my control bubble, then open up the middeck to vacuum. Then when the skiff tears away we may hardly notice."

"Don't make me laugh," Paula said. "You don't know what the failure modes are in this situation. We could come to pieces, too."

"That's why I need you to agree that we should try it."

"You didn't honestly think I'd say `no,' did you?"

He closed her door on his way through and hit the button that sealed it against vacuum. Again he ran to the control bubble, sealed himself in, and opened up the airlock to the middeck. He could hear the air whistle out for a few moments before silence descended.

He turned the ship toward Earth, could see the twin planet Earth-Luna system looking like a pair of exquisite gemstones lying on black velvet sprinkled with diamond dust. He ramped up the acceleration. Ten gees. Fifteen. Eighteen. At 19.5 there came a shredding sound and the ship shuddered, then a horrendous shriek transmitted through the hull and the ship was still again.

"Paula, we seem to have survived," he told her through the comm.

The *Hyperlight II* was still hours from Earth, but now that he was sure he'd get there, he acknowledged the call from the High Command.

"This is Lieutenant Robert Nachtgall of the streakbomber *Hyperlight II*. Message received and acknowledged. I'm on my way."

* * *

The Phinons were fleeing. This should have been a time of jubilation. The parties should have started. They should have all been shit-faced by now. *They're fleeing except for four. And that makes all the difference*, Rick thought.

No one had left the tracking room that Rick could see. At least, not permanently. Sammi and Dykstra had gone back to their rooms and returned a couple of times. No doubt others had, too. But now Sammi was pacing back and forth along the rail. Dykstra had finally decided to have a chair brought for him and was sitting with his arms resting on the rail, his chin on his arms, just staring at the main screen. Hague was still monitoring Phinon chatter, but there was nothing new to report. The men down below were busy observing the Phinon fleet, confirming that the main body of ships was still leaving, and also tracking the four incoming vessels and sending the data to Bob.

Thank God Bob and Paula made it. What would I do without her? Or even him?

To pass the hours before the final encounter, Rick had set for himself the task of analyzing the abrupt ending of the transmission from the *Honeymoon*. The others had been saddened to learn about that. Reviews of tracking data showed that at the time of LOS, the colonel's ship was still traveling at .42c, seemingly intact. *But that doesn't mean they're not dead*. And everyone knew it.

But even after the long hours of analysis, all Rick still could say for certain was that their signal had stopped, but he had no idea why.

"Chris, how many of the Phinon ships could Bob possibly destroy?" Sammi asked.

"I've been following the tracking data," Dykstra answered, looking at her and catching Rick's eye, too. "Bob is only some few light-seconds away now. No matter what he does, he's only going to be able to get two of the Phinon ships. Obviously, the second ship will be one of those on its way to Earth. The first could have been either the one headed for us, or another of those going to Earth. But he'll have to pursue the Earth-bound one. The Moon is an airless world—what's another big crater? And even if everyone on her dies, it's only a trivial fraction of those who would die if the other ship makes it to Earth."

Dykstra had turned back toward the screen. "Ah, look," he said, pointing. There was a small kink in the line on the display that showed the trajectory trace of the *Hyperlight II*. "If the question wasn't moot to begin with, it would be now."

The Moon had to fend for itself.

* * *

The *Hyperlight II* was closing to within range. Flashbacks to his encounters out in the Oort cloud flickered through Bob's mind, but now the stakes, unbelievably high, were readily apparent.

The Phinon ship knew he was coming, too. Bob had already ridden through two blasts of X-ray laser fire. Despite the hole in his ship, the shields were holding just fine.

He kept up a running commentary to the High Command. "Closing. I want to be close. I want to disintegrate the bastard so none of his bomb load is left intact." His superiors at the High Command knew all this, of course. But he had no one else to talk to. Not even Paula—the traumabot had put her into a deep sleep.

Nothing left behind, Bob thought as he activated both the particle beam weaponry and the lasers. He also armed the missiles in the weapons array in case there were any pieces left big enough to warrant destruction.

The Phinon ship was under full thrust, and Bob was closing from above. He remembered the Phinon ship out in the Oort cloud that had self-destructed. Of course, that one had spent itself and didn't have any bigger fish to fry, either.

Bob fired. The Phinon's shields lit up, glowing brightly, an incandescent pearl, her color climbing up the spectrum. Then catastrophic failure and a most satisfying explosion.

"Nothing left bigger than a marble," Bob radioed to the High Command.

* * *

"They're acting differently than they did at Jupiter," Dykstra said, concerned. "But they didn't meet any opposition there. The ship Bob just destroyed was under drive. Let's hope there aren't too many more surprises from them this late in the game."

"We don't understand the Phinons as well as we thought we did, do we?" Sammi commented. She had wearied of pacing and Dykstra had summoned another chair for her so she could sit beside him as they watched the unfolding final Phinon encounters on the screen. She pointed at the screen. "Looks like Bob is close to catching up with the second one now. But when are *we* going to do something?"

Rick came over. "Arie still hasn't heard anything from the remaining three ships. But all the other ones really are fleeing, including a bunch of those we infected. Looks like we scared the hell out of them," he told them. He looked over the rail. "I see they have guys at the battle console now. Won't be long and they'll go after the lead Earth-bound ship."

This wouldn't be easy. The ground batteries of the High Command were both particle beam weapons and

lasers. The particle beams could lance out at nearly the speed of light, but not quite. To have both the lasers and the PBWs hit the swiftly moving target at the same instant from a distance of almost a light-second required a degree of coordination seldom attempted. Nothing the Belt had ever thrown at Luna had required both beams to hit the same target simultaneously. The High Command wanted to kill the ship with one shot. They didn't want to risk needing two.

"They're preparing to fire," Rick said, and then all three just watched the screen, again. The war with the Phinons was in the hands of others now.

A white and a green line appeared on the screen, the white, representing the particle beams, beginning a split second sooner. In one second the two beams converged on the red blip that was the Phinon ship, following it. A few seconds later the tracking data returned and the screen reported the Phinon ship destroyed.

A cheer went up from below.

"That's another one killed!" Rick exclaimed. "All right!"

"But what are those three new little red spots?" Sammi asked. The spots were diverging, but still heading for Earth.

"Oh, shit."

The chatter from the floor brought them the bad news.

"Three bombs survived our attack," Dykstra said. "And these bombs are shielded. We didn't see that at Jupiter, either."

"What do we do now?" Sammi asked, watching the screen in horror.

"They're doing it," Rick said in resignation. "They're aiming our beams at the Moon-bound ship."

There was nothing anyone could do to prevent the Earth from still getting a taste of the destruction the Phinons had intended.

Nothing at all.

* * *

This geometry sucks! Bob thought as he checked the scanner display. He, too, could see the bombs released by the destroyed ship, but there was no way he could intercept them. *Dammit!*

He continued his pursuit of the second ship, again closing rapidly. The *Hyperlight II* was nearly two light-seconds from Earth. At her velocity, the Phinon ship would cover that distance in about three minutes. The Moon-bound Phinon was about the same distance from her target. Bob knew that the High Command would be redirecting its firepower at that one, now.

"Ready to fire on target two," Bob radioed to the High Command. *Just a little closer. Just like last time.*

A beam shot out from the Phinon ship. Bob could see it as it destroyed the sparse dust of interplanetary vacuum.

All the way down to the High Command.

What the hell? "What the hell!" he yelled. "Tracking center, what the hell just got hit!"

In the several second interval before the reply, Bob let loose with his own weapons. But this ship fought back with all the fury it had left in it.

After it dropped its bombs.

"Oh, God dammit! Bastard! Shit!" Bob screamed to the space outside his bubble as he saw that the bombs were under their own power, shielded, and on diverging courses. *We underestimated these devils.*

All Bob could do was to return fire on the ship, using lasers and PBWs of his own. He had no doubt that he would take it, and in fact opened up some distance between the two craft now that its bomb load was gone. He fired a salvo of four missiles which converged on the ship. But the ship self-destructed before they got there and their detonations were nearly unnoticeable.

"High Command to *Hyperlight II*. The beam hit the PBW batteries, and the explosion took out half of the laser cannons as well," the reply from Luna came in.

Just like with OEV 1. They saw Luna fire and they nailed the spot from over a light-second away. But they ignored me during that time. Why?

There was no time to think about it. He went after the closest of the bombs.

* * *

It was structured chaos in the tracking room. Men and women were hustling from station to station. Orders were being yelled across the main floor. The big screen had been split—the right side showed the oncoming Phinon ship, the left, the image of Earth as the first of the three bombs approached.

"No, Arie says the two ships were not communicating with each other. They still haven't said anything since the genanites hit them," Rick told Sammi.

"But that had to be coordinated, didn't it? It had to be," she said. "Chris—didn't it?"

Dykstra was slowly tapping his cane on the floor, no doubt obliviously. He couldn't take his eyes off the screen. Still, he heard Sammi's question. "Maybe it was coordinated millions of years ago," he said. "Or maybe `soul' is a more subtle concept than even I ever thought." And then to the Universe in general it seemed, he added, "We were expecting Jupiter all over again. Oops."

"We have a couple laser cannons left," Rick said. "They should still be able to get the incoming ship, now that Bob took out the other one."

"That one's bombs got away, too," Dykstra noted.

"We'll have to hold off firing to see if the ship drops its bombs. Hit the bombs instead," Rick added. "They'll be coming right down our throat. We can probably hit most of them."

"Hold off for how long?" Sammi asked.

Seconds passed.

They watched the left side of the screen as the three bombs impacted the Earth. Two came down in the heart of the Pacific Ocean and one off the coast of China—little actinic arc-welding sparks for an instant, then a spreading wall of cloud, obviously angry even when seen from the surface of the Moon.

"I don't think our ship is going to drop its bombs at all," Sammi finally said. "It's coming right in with them."

Green laser lines on the screen flashed up suddenly to meet the ship. The ship survived the attack.

"They are talking, oh yes, oh yes. They are talking," Hague suddenly exclaimed.

"What?" Rick shouted and raced to be at Hague's side. "What are they saying?"

Hague paused for a moment, listening. "Repeating, yes, yes, repeating." He listened some more, then looked up. " `Good-bye,' yes, oh yes. They are saying `good-bye.' "

"Secure for full shielding," came over the PA. It was clear that even if the Phinon ship was destroyed, bombs would likely make it to the surface. The High Command would be underneath the biggest Dykstra shield in the Solar System when that happened. As long as a bomb didn't land right on them,

they'd all likely survive.

"`Good-bye,' " Dykstra repeated.

"Full shields in five seconds, mark," said the anonymous PA voice.

"Maybe the Phinons know about John 15:13, too," Dykstra said, and then the shields went up.

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XVI

Sammi had borrowed a hopper from the docks at the High Command to make the trip to the Sea of Tranquility. She hadn't flown one in ages, and then only a few times after Steve had taught her how. But she didn't want Bob to bring her out to the cemetery, and now that Luna City was gone, she couldn't get public transportation either.

But at least the cemetery was still there. As she was dropping altitude over it, she could see the ripples in the no longer geometrically precise alignments of the headstones. The surface shockwaves from the Phinon bombs had recorded their passage in the markers of the dead, as well as in the minds of the living.

The shields protecting the High Command had been shut off after the seismic activity from the bomb blasts had abated. The bombs had impacted 300 kilometers away, and the High Command escaped relatively unscathed, though the observation bubble that Sammi and Dykstra had been so fond of had been torn off the mountain, it lying just outside the sphere of the shields.

But Luna City was no more. The section of surface where it had been was now inside the perimeter of the new crater created by the blast. Most of the rest of the Lunar assets—the cities, the bases, the astronomical arrays—had suffered extensive damage and fully three-quarters of everything would have to be rebuilt.

Earth didn't get off so easy. Violent storms would rage for years before the climate settled back down. Tsunamis had redesigned coastlines the planet over, geological faults had released their pent-up stored energies, and the Ring of Fire volcanoes, some dormant for millennia, were erupting once again.

There were 160 million confirmed dead. There wasn't even an estimate about how many were missing. The survivors had too many other things to do to continue keeping up with that numbers game. Sammi and Bob had been helping them for months, flying in new portable mass conversion units all over the globe.

The loss of life could have been much worse, she realized. Bob had been able to knock out one of the bombs his last Phinon ship had released. Of the remaining two, one had failed to explode, and the other had landed in Siberia, ironically not a hundred kilometers from Tunguska. And there had been time for the coastal cities to clear out. Still, as they'd traveled around the world, she'd been astonished at how many people didn't know what had happened to them. There were places in Central Asia, Africa, and South America where the folk had never heard of the Phinons, were perhaps dimly aware at best that there was even a Solar System out there on the other side of the clouds.

But from deep space came some good news. Expeditions to the Phinon comets confirmed that the aliens had fled the Oort cloud. Visitors to their worlds had found numerous "bean bag chairs" of dead Phinons

scattered around, but not a single live one, and not a single ship in working order. They'd left in a hurry. In most of the comets, they hadn't even turned out the lights.

Sammi's genanites had had their day after all.

Captain Brinn and his retinue of talented refugees reported from the Tau Ceti system that one of the planets, although a tad bit hot, was likely only a few years of terraforming away from being shirtsleeve habitable.

Sammi would be joining them soon. But she needed to say good-bye to Steve one last time.

She brought the hopper down at the visitor center. This time there was no attendant to meet her, though two scooters were still sitting in their stalls. Good thing. She couldn't find Steve's marker without one.

The scooter worked. Sammi programmed it for Steve's spot and it set out as if nothing had even happened to disturb the surroundings.

From ground level the place didn't look too bad. Some markers were overturned completely, but most were only leaning, and a very few seemed to have been oblivious to the attack altogether.

After a few minutes, she spotted another figure out among the markers. She didn't even have to confirm that the cross the person was beside was Steve's to know that it was Dykstra.

Dykstra had turned to watch her approach, and Sammi hopped off the scooter and came to stand beside him. "Did Bob tell you I'd be here?"

"No," Dykstra replied. "But this is your last day on Luna. Jenny would have waited until the last day before visiting Jamie's monument if she were headed to the stars. I knew you'd do the same."

"You were right," she said. "First to Ceres for a week. I guess a lot of Belters are going, too. Brinn reported there's a sizable asteroid belt around Tau Ceti. Then six months in hyperspace. Then . . . my old friends again."

"How did Bob take the news?"

"I think he knew our time was almost up," Sammi said. "He's a wonderful man, Chris. But I was starting to resent the parts of him that weren't like Steve. I'm not ready yet. The war confused that. The war confused a lot of things."

Sammi looked up at the Earth, the beauty of her pearly clouds indicating the presence but hiding the impact of the climatic upheavals that would make living there a dangerous game for years to come. "I

need a clean break, Chris. And I'm lucky—I can have one. Not like the people up there. Their break with the past is as dirty as they come."

"But at least they are still there to remember a past," Dykstra said, also gazing at the Earth, that cradle of humanity.

"There is that," she said. "But there are seven billion people on Earth. Why didn't we let them in on the secret when the Phinons first showed up? Maybe one of them would have had a better idea than what we came up with, something better than Doomsday genanites." Her tone was getting bitter. She didn't care. "If we'd lost the Earth, would we even care that five thousand years from now the last Phinon in the galaxy will be choking on its own body fluids and not knowing why?"

"It's a little late for guilt, Samantha—"

"Late? It's the perfect time for guilt. The dirty deed is done. When else were we supposed to feel guilty? You can't look at *that*," she said, pointing at the Earth, "and say you're proud of our rousing success."

"Proud? No. Happy? No. But that we're still here to mull it over is important, Sammi. It's the most important thing to ever happen to the galaxy, and I think history will judge us that way."

"God, too?"

"He'll say, 'Well done.' "

Sammi was quiet for a moment, then softly she said, "Not me."

It was time to confess. God already knew. History would find out. But Dykstra had to know.

"How long do we have, Sammi?" Dykstra asked to her surprise.

"You *knew*?"

"I suspected. I came here to find out for sure."

"One thousand years, Chris. In one thousand years, the genanites will cease to work. They won't be able to manufacture their nanotools anymore," she answered.

"How did you decide upon a thousand years?"

"The Phinons gambled that they could take us on and win. I gambled that a thousand years of decimation still won't kill them all. How did you know I'd do it?"

"Because it's what Jenny would have done. When I had my heart attack, I had what they call a `near death experience.' " Dykstra related the episode to her. "It could have been real. It could have been a dream. But I was sure there was a reason for it, and for why Jenny figured in it so prominently.

"Limiting the destructive scope of the genanites was always a possibility. I would have argued against it. Safer that way. But something happened to you when you watched that Phinon die. It was then that I suspected you might alter the genanites just that twinge to let them off the ultimate hook. But remembering Jenny, I deliberately didn't look, nor tell anyone my suspicion."

"Thank you. But why did remembering Jenny . . . ?"

"Because Jenny had a way of being more right about some things than I was. For whatever reasons, Destiny put the fate of the Phinons into the hands of Samantha MacTavish. And I can't help but think Destiny—God—would have made the right decision."

"I think He did," Sammi said. "I hoped Knoedler wouldn't catch me until it was too late. I didn't know he had other things on his mind, though. But I'm surprised Security still hasn't come looking for me. Divine intervention there, too? Or maybe something closer to home?" She looked at Dykstra.

He winked.

"Now you tell me something, Sunshine. Can the human race be trusted with a weapon that can blow up a star?"

Sammi had no idea what to say to that.

"That's okay. It was a rhetorical question. I used to think I knew the answer to it. But the Earth, the whole human race, just received a massive wake-up call. We've been so stupid. *I've* been stupid. The Universe is bigger than the prejudices we bring to it, and will humble us the second we think we have it pegged," Dykstra said, but now he was musing.

He trailed off after a minute and Sammi felt free to change the subject. "How are the others? Arie? Rick and Paula?"

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* * *

The End

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XVI

Sammi had borrowed a hopper from the docks at the High Command to make the trip to the Sea of Tranquility. She hadn't flown one in ages, and then only a few times after Steve had taught her how. But she didn't want Bob to bring her out to the cemetery, and now that Luna City was gone, she couldn't get public transportation either.

But at least the cemetery was still there. As she was dropping altitude over it, she could see the ripples in the no longer geometrically precise alignments of the headstones. The surface shockwaves from the Phinon bombs had recorded their passage in the markers of the dead, as well as in the minds of the living.

The shields protecting the High Command had been shut off after the seismic activity from the bomb blasts had abated. The bombs had impacted 300 kilometers away, and the High Command escaped relatively unscathed, though the observation bubble that Sammi and Dykstra had been so fond of had been torn off the mountain, it lying just outside the sphere of the shields.

But Luna City was no more. The section of surface where it had been was now inside the perimeter of the new crater created by the blast. Most of the rest of the Lunar assets—the cities, the bases, the astronomical arrays—had suffered extensive damage and fully three quarters of everything would have to be rebuilt.

Earth didn't get off so easy. Violent storms would rage for years before the climate settled back down. Tsunamis had redesigned coastlines the planet over, geological faults had released their pent-up stored energies, and the Ring of Fire volcanoes, some dormant for millennia, were erupting once again.

There were 160 million confirmed dead. There wasn't even an estimate about how many were missing. The survivors had too many other things to do to continue keeping up with that numbers game. Sammi and Bob had been helping them for months, flying in new portable mass conversion units all over the globe.

The loss of life could have been much worse, she realized. Bob had been able to knock out one of the bombs his last Phinon ship had released. Of the remaining two, one had failed to explode, and the other had landed in Siberia, ironically not a hundred kilometers from Tunguska. And there had been time for the coastal cities to clear out. Still, as they'd traveled around the world, she'd been astonished at how many people didn't know what had happened to them. There were places in Central Asia, Africa, and South America where the folk had never heard of the Phinons, were perhaps dimly aware at best that there was even a Solar System out there on the other side of the clouds.

But from deep space came some good news. Expeditions to the Phinon comets confirmed that the aliens had fled the Oort cloud. Visitors to their worlds had found numerous "bean bag chairs" of dead Phinons

scattered around, but not a single live one, and not a single ship in working order. They'd left in a hurry. In most of the comets, they hadn't even turned out the lights.

Sammi's genanites had had their day after all.

Captain Brinn and his retinue of talented refugees reported from the Tau Ceti system that one of the planets, although a tad bit hot, was likely only a few years of terraforming away from being shirtsleeve habitable.

Sammi would be joining them soon. But she needed to say good-bye to Steve one last time.

She brought the hopper down at the visitor center. This time there was no attendant to meet her, though two scooters were still sitting in their stalls. Good thing. She couldn't find Steve's marker without one.

The scooter worked. Sammi programmed it for Steve's spot and it set out as if nothing had even happened to disturb the surroundings.

From ground level the place didn't look too bad. Some markers were overturned completely, but most were only leaning, and a very few seemed to have been oblivious to the attack altogether.

After a few minutes, she spotted another figure out among the markers. She didn't even have to confirm that the cross the person was beside was Steve's to know that it was Dykstra.

Dykstra had turned to watch her approach, and Sammi hopped off the scooter and came to stand beside him. "Did Bob tell you I'd be here?"

"No," Dykstra replied. "But this is your last day on Luna. Jenny would have waited until the last day before visiting Jamie's monument if she were headed to the stars. I knew you'd do the same."

"You were right," she said. "First to Ceres for a week. I guess a lot of Belters are going, too. Brinn reported there's a sizable asteroid belt around Tau Ceti. Then six months in hyperspace. Then . . . my old friends again."

"How did Bob take the news?"

"I think he knew our time was almost up," Sammi said. "He's a wonderful man, Chris. But I was starting to resent the parts of him that weren't like Steve. I'm not ready yet. The war confused that. The war confused a lot of things."

Sammi looked up at the Earth, the beauty of her pearly clouds indicating the presence but hiding the impact of the climatic upheavals that would make living there a dangerous game for years to come. "I

need a clean break, Chris. And I'm lucky—I can have one. Not like the people up there. Their break with the past is as dirty as they come."

"But at least they are still there to remember a past," Dykstra said, also gazing at the Earth, that cradle of humanity.

"There is that," she said. "But there are seven billion people on Earth. Why didn't we let them in on the secret when the Phinons first showed up? Maybe one of them would have had a better idea than what we came up with, something better than Doomsday genanites." Her tone was getting bitter. She didn't care. "If we'd lost the Earth, would we even care that five thousand years from now the last Phinon in the galaxy will be choking on its own body fluids and not knowing why?"

"It's a little late for guilt, Samantha—"

"Late? It's the perfect time for guilt. The dirty deed is done. When else were we supposed to feel guilty? You can't look at *that*," she said, pointing at the Earth, "and say you're proud of our rousing success."

"Proud? No. Happy? No. But that we're still here to mull it over is important, Sammi. It's the most important thing to ever happen to the galaxy, and I think history will judge us that way."

"God, too?"

"He'll say, 'Well done.' "

Sammi was quiet for a moment, then softly she said, "Not me."

It was time to confess. God already knew. History would find out. But Dykstra had to know.

"How long do we have, Sammi?" Dykstra asked to her surprise.

"You *knew*?"

"I suspected. I came here to find out for sure."

"One thousand years, Chris. In one thousand years, the genanites will cease to work. They won't be able to manufacture their nanotools anymore," she answered.

"How did you decide upon a thousand years?"

"The Phinons gambled that they could take us on and win. I gambled that a thousand years of decimation still won't kill them all. How did you know I'd do it?"

"Because it's what Jenny would have done. When I had my heart attack, I had what they call a `near death experience.' " Dykstra related the episode to her. "It could have been real. It could have been a dream. But I was sure there was a reason for it, and for why Jenny figured in it so prominently.

"Limiting the destructive scope of the genanites was always a possibility. I would have argued against it. Safer that way. But something happened to you when you watched that Phinon die. It was then that I suspected you might alter the genanites just that twinge to let them off the ultimate hook. But remembering Jenny, I deliberately didn't look, nor tell anyone my suspicion."

"Thank you. But why did remembering Jenny . . . ?"

"Because Jenny had a way of being more right about some things than I was. For whatever reasons, Destiny put the fate of the Phinons into the hands of Samantha MacTavish. And I can't help but think Destiny—God—would have made the right decision."

"I think He did," Sammi said. "I hoped Knoedler wouldn't catch me until it was too late. I didn't know he had other things on his mind, though. But I'm surprised Security still hasn't come looking for me. Divine intervention there, too? Or maybe something closer to home?" She looked at Dykstra.

He winked.

"Now you tell me something, Sunshine. Can the human race be trusted with a weapon that can blow up a star?"

Sammi had no idea what to say to that.

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