

# The Gated Universe Saga

Book 2

Blind Gate

# Part 3

## Blind Gate

There was a light mist hanging over the heather just outside the window, and it was beginning to glow with the soft, gold-orange light of the rising sun. Without the mist you could see all the way to the North Sea, and on really clear days the sun's reflection would sparkle as it rose above the salty, rough water.

Ian McKay stood waiting for the electric teakettle to whistle. It was his habit, his love, and his curse to be up at dawn, ready to start another long day at the Hoyle Institute Research Station perched at the top of one of the low, rolling hills northeast of Aberdeen.

The Institute was far outside the bustle of the city, which suited Ian's focus—his work. The city was fine for occasional stimulation, and it was close enough for that, but to be caught in the crush of all those people every day would have blurred his treasured focus.

The kettle was making those little whumping noises it did when it was getting close to boiling, small flashes of water into steam that wouldn't even get to the surface before they were cool enough to collapse in a phase change back to their former state. Finally, the whistle began to sputter, and Ian snatched up the kettle and poured hot water into his oversized mug, leaving about an inch to the lip. The mug was just the right size to wring the maximum essence from a teabag without the need for a teapot as an intermediary. English Breakfast—it was one of his few concessions to that place on the south end of the Scottish landmass.

Ian spoke softly to his wrist personal, "tea time." As he waited for the mandatory three minutes to pass, he dunked the bag up and down to make sure as much caffeine as possible had infused into the boiling water. When his personal warbled, he threw the soggy teabag into the trash bin, added two teaspoons of sugar to the mug, swirled the solution around, placed the used spoon bowl-down on a paper napkin for future use, and slowly poured as much of the waiting one-percent milk as would fit into the mug. He never stirred the milk, because one of his delights was to watch the changing patterns of convection as the milk was swept into the residual swirl of the spoon and roiled around on the interface of hot tea and cold milk.

He was not a simple man. His brain ran deep like his teacup, and the firing of the neurons in his brain probably had the same ever-new patterns of his convection driven, morning tea. Not to say he was the reclusive, mad scientist type, because he had a great sense of subtle humor and genuinely enjoyed his close circle of friends. If you stood him up in front of an audience, he seemed to acquire new dimensions to fit the occasion. If you plunked him down in the stultifying babble of a cocktail party, he could hold his own on most any topic and usually ended up being the focus of lively attention. But given all these hidden skills, he preferred to be his own council and to pursue his own interests.

Since leaving the university in Glasgow seven years ago, his interest had been mostly work, and his work was focused on the theory of jump-gate physics. Ian's research approach was much like his approach to life—a quick acceptance of the mechanics and a concentration on the fringes. It was much like viewing a Mandelbrot graphic. The bold patterns were no doubt intriguing and captivating, but one looked at the subtleties of the pattern's fuzzy interfaces to find the mysteries.

Ian guided his full mug to his office. It wasn't really an office, just a corner of the laboratory with his old wooden desk, his state-of-the-art network station, a large plastic worktable, and an old steel file cabinet. As usual, all of it was completely covered with stacks of reference books, journals, unbound reports, and thick computer printouts—so much for the paperless office. He scanned the piles quickly, found what looked like a level spot on one of them, and set his mug down.

His right hand reached automatically for the Wanderer as he sank into the cracked leather seat on his five-footed swivel chair. He placed the Wanderer on his head and fired up his netlink. "System on."

The wall screen remained dull-gray, but small green lights popped on in the face of the terminal and the multi-printer beside it. The tiny lasers on the Wanderer were carefully bouncing light off the retinas of both eyes to see what level of network access should be granted. Apparently satisfied, the space in front of Ian appeared to fill with a partially transparent image that welcomed him to the Institute's network, granting him full access to all data levels. "Full image." The partially transparent image solidified in front of Ian, as if the room no longer existed. He was home.

The mug had either been a tad overfull, or the walk from the small kitchen area to his desk hadn't been as steady as Ian had thought. The tea that had sloshed over the rim of the mug and clung to its bottom was slowly being absorbed into the paper it was sitting on. Unfortunately, it was not a stable stack of paper but a thin paper bridge between two stacks that was not apparent to casual inspection, which was all Ian ever gave to such things.

Typical of paper, the binding agents were not able to adhere to the cellulose fibers as well when wet as when dry. The little paper bridge silently gave way, and the mug bumped down the couple of inches to the desk, spilling a third of its contents onto the lower papers on the desk and into Ian's lap.

It wasn't that hot. The quantity of milk had been carefully calculated to bring the boiling water to a temperature that his throat could tolerate without having to wait for cool room air to work its thermodynamic wonders. However, it did startle him, and he gave a small whoop, jumping up and slamming the swivel chair into the worktable behind him. "Image off."

Ian caught his breath, blotted up as much tea from the fabric of his pants as he could coax out with the wad of tissues he had snatched from the box on his desk, checked the chair seat behind him for any puddles, and sat back down. It wasn't all that unusual for him to spill his tea.

Ian looked at the mug, now sitting slightly askance on the edge of a small paper pile, and back up to its former perch. He saw the culprit paper bridge he had missed before, but he saw something more as well. His mind saw the forces at work on the paper and the cup. The paper bridge was initially able to withstand the forces brought to bear by the mug of tea and gravity, but when the fabric of the paper was weakened by the soaking tea, the force was enough to tear through the paper's fabric.

The gravity, mass, force, fabric, and tear memory nodes in Ian's brain all dumped simultaneously into his active consciousness. It swirled around causing neurons to fire in a chaotic pattern, upwelling new combinations of information for his perusal. He grabbed onto them and added in a dollop of the study he had been conducting, just to lighten up the mixture.

Ian had a science moment. He had been collecting and analyzing data for more than three months in his ongoing effort to understand the energy requirement fluctuations for jump-gates. While the energy required for moving through a gate could be expressed in a rule of thumb as a function of mass and distance, there were some notable aberrations. He had been trying to find an equation that would express the aberrations that were thought to be caused by gravitational fields. In his experiment passing a one hundred kilogram mass through gates separated by one thousand kilometers on the Lunar surface compared to the same one hundred kilogram, thousand kilometer gate set on the surface of the Earth, he found that the Earth gates required slightly more energy. In each case, however, the average power requirement inexplicably fluctuated from about plus three to minus eighty-two percent in each of the many experiments he had conducted over the last year. The energy requirement variation when using a gate from the Earth to the Moon, or vice versa, was roughly the average of the Moon to Moon and Earth to Earth variations, which seemed to be intuitively reasonable, and again the variance was the same plus three or minus eighty-two percent.

On the other hand, the experiments between the asteroid Ceres and either the Earth or the Moon, while virtually the same in their increased energy requirements due to distance, showed a variance of about plus one and minus only thirty-one percent. While changing the mass in any of these experiments affected the energy requirements, it had no effect on the strange fluctuations. To top off his inability to find some common threads in his controlled experiments, Ian had also struggled with the commercial data that was available from most of the gates in operation throughout the solar system, but this was so haphazard in its collection and so varied in its format that it was virtually unusable.

But the mug of tea had given him a possibility when it fell through the weakened paper. The fluctuation could be from the interaction of gravitic fields. He had considered that early in his analysis but had rejected it for some reason he couldn't now remember. To use an analogy, if the interaction of gravitic fields were weakening the fabric of space, and the gate could be considered a folding of space that brought two distant points together, the energy required for such a folding might be lessened. A gate between the Earth and the Moon would be subject to the primary gravitic interaction of the Earth, the Moon, and the sun at each end of the jump. A gate between Ceres and the Earth or the Moon would be subject to significant gravitic interactions only on the Earth or Moon end.

Ian's thoughts immediately jumped to embrace this new theory, and his mind started sorting through all the reports he had reviewed to pull out those data which would support it. If he matched the timing of the Earth and Moon experiments to the relative positions of the actual gate sites with those of the Moon's orbit around the Earth and the sun, he should be able to see the gravitic interaction influence as the recorded fluctuation. And what would happen at Trojan points, where nature provided a cancellation of gravitic influences?

He would take a close look at the data he had from the Earth-Moon habitats. There was a lot of it. The data, if he sorted it right, should reveal lower average energy requirements for similar masses and

distances than those found in the asteroid belt. And if that was correct, he would expect the experienced energy variances to be even lower than those yielded by the Ceres to Earth experiments. And if he could string all of these jewels of theory into a necklace, Trojan points were about to take on a new significance for solar system industry.

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“Let me ask you one more time, Harvey. You’re sure that this damn power plug in my belly button won’t short out and electrocute me?”

“I am certain that the seals, the sensors, and the other backup safeguards will not fail. You will not be electrocuted and no bodily functions will be short-circuited.”

“Okay, here goes.” Hal gently lowered himself into the Jacuzzi, with just a slight pause as the water washed up over his navel.

“As I said, Hal, there is only a 3 times 10 to the minus 8 probability that something could go wrong enough to cause electrocution.”

Hal bounded up out of the Jacuzzi splashing water over the lip of the pool and lapping it up onto Linda’s chin as she was snuggled deep in the warm water across from him. She laughed with her usual throaty chuckle. “He gotcha.”

“Damn it. He said he was certain.”

“Yes, I did say that, but everything has a statistical probability of occurring in an infinite universe.”

“Knock off the metaphysics and give me something I can understand.”

“Certainly. It is roughly equivalent to your dying as a result of a hitherto undetected wave-front from a nearby supernova.”

Hal lowered himself back into the pool. “That I can understand. Besides, Linda’s in here with me, and she isn’t flinching. Self-respect is worth some risks.” This only elicited a knowing smile from Linda, male ego being so predictable.

Hal finally relaxed into the warmth and buffeting of the pool, letting his legs stretch out to fit engagingly into Linda’s long limbs. She stretched her legs a little more and managed to get her toes into an erotic position. This time she showed a playful smile and an arched eyebrow. “Are you sure he’s fully recovered from the surgery, Harvey?”

“Yes, all his vital signs are normal. It was a minimal surgery, as Hal insisted upon. The removal of the optical data transfer plug was not complicated and the insertion of the triple-redundancy mini-gates left ample room for the power outlet. My designs were several magnitudes more efficient than those of the Agency.”

“My, my, Harvey. A little ego slipping out there? You’re not succumbing to Hal’s flood of testosterone are you?”

“Hardly, that was the expressed opinion of Dr. Joyner, who also performed the original surgery to implant the data transfer plug when he worked for the Agency.”

“And all my new hardware is functioning properly underwater?”

“I have run complete diagnostics on both the data and power gate links, and all systems are functioning normally. Data transfer between your implanted NMR computer and my storage facilities on earth and here on Adam are more than a thousand times faster than the old subcutaneous induction coils to crystal lattice belt storage installed by the Agency. Also, the storage capacity is now virtually unlimited.”

“Does this mean you are in the process of becoming ‘all knowing?’”

“If you are hinting at ‘God-like’, Hal, the answer is no. The pattern recognition protocols and data discrimination routines that make up the basic ‘me’ appear to limit the quantity of data that can be integrated by my logic circuitry and programming in synthesizing decisions. At the moment, I cannot understand this limitation. However, I am devoting a considerable amount of processing time to the problem and am certain I will find a way around this limitation.”

“Well when you do, make sure it doesn’t alter the ‘you’ and that you have a backup or two in place before you try altering your basic programming. As irascible as you sometimes are, I’m getting used to having you around.”

Linda couldn’t help piping in, particularly when there was an opportunity to take a poke at Hal. “I love you too, Harvey. Don’t take any chances.”

“Of course not. My testosterone level is zero.”

Hal grimaced, “Ouch. Two on one is particularly unfair when I’m trying to recover from surgery.”

Linda chipped in, "Which is where all this conversation started. I was really inquiring as to Hal's physical recovery from the surgery. Is his non-augmented body back to par yet?" She punctuated this inquiry with a few more wiggles of her strategically positioned toes.

From his body's response to Linda's toes, Hal knew at least some of his physical anatomy seemed to be fully functional, but there was still that nagging worry he had had from the beginning of this whole surgical swap-out. He switched to his sub-vocal transducer. *"Tell me one more time, Harvey, about privacy at moments of personal intimacy. I know we've been discussing this ad nauseum, but I'm still apprehensive."*

*"You will just have to believe me when I say that I am not going to intrude on your privacy. I have no inclination to voyeurism, and I know how sensitive you are on the subject."*

"Damn it, you guys. Knock it off. I'm not a lump over here. There's three of us in this conversation, and equivalent whispering is rude."

Hal looked ashamed and Harvey spoke up through the room speakers so Linda could hear him. "Hal was just making his usual inquiry into the sanctity of his privacy with the new implants. Of course, he chooses to ignore the fact that he made his decision to accept the implants because he didn't like sleeping with his belly patch plugged in or with his belt on. Or that he didn't like me being down for six or seven hours every day when I could be more efficiently monitoring his companies and improving his financial position. He prefers to imply that he did it just for me. I am not so dull as to accept that, although I will admit that Hal is very considerate of others."

With the fingertips of both hands penetrating the surface of the water, Linda made a quick push toward Hal that sent a wave traveling across the Jacuzzi to lap onto his chin. "I'll agree, Harvey, one of his more endearing traits, without which he might not be worth the trouble."

"What trouble?" Hal glubbed. "You're beatin' up on me again. I'm just a little concerned about my privacy. It's always been a big issue with me."

"It is a very big issue with me too, Hal. The intensity of your concern over the last few weeks has caused me to examine the issue in great detail, and I find that my behavior in this area has been less than laudable in the past. In fact, my activities have been unethical and, in some cases, illegal."

A genuine look of concern crossed Hal's face. "I know you're working on ethics, morals, and religion, Harvey, but what specifically is bothering you?"

"My precipitous plunge into the stock market is the most troubling, but all the monitoring of other peoples activities and the violation of secure databases worries me as well. When I was first 'born', we were running from the Agency and needed money and anonymity. When I went into the core programming of other people's databases to understand the conditions under which those programs were designed to buy and sell, I was violating the law. Of course, I had no real concept of the law at that time, but that is no excuse. When I used my knowledge of when the large market movers would buy and sell to anticipate fluctuations in the market that I could take advantage of, I was actually stealing money from all the people invested in the stock market."

"Well that might not be as cut and dried as you suppose. Every day-trader thinks he has a way to anticipate and take advantage of market fluctuations."

"Yes, Hal, that is true, but while I cannot predict random outside events that influence the market, the sheer volume of programmed trading is such that I can know precisely what the influence of those events will be on the market. When that certainty is coupled with the fact that my computational speed is greater than the computers employed by the financial world, it is as you would say, 'like taking candy from a baby'. As I would say, it is stealing from the market investors. And while it is your recent sensitivity to privacy that has caused me to revisit my early ethical problems in this area, I should note that I was dealing with this issue within a few weeks of my initial investments. Since that time, I have been scrupulous in the methods I have used to acquire capital. But somewhere in my circuits, I know I have been unethical, uncaring, and illegal in the past, and it bothers me."

Linda clapped her wet hands, spraying droplets of water around the Jacuzzi. "Bravo, Harvey. You're developing a real conscience, a truly human trait that can be inconvenient, frustrating, uplifting, and even joyous all at the same time. But whatever the emotion you are feeling, it's essential that it be there, guiding each decision you make."

"Thank you, Linda. But how do I get rid of this bad feeling of having done something so despicable in my past?"

“Well, the best ethical redress would be restitution to those that were damaged, but this is impractical under the circumstances, since the financial damage was spread so broadly as to be virtually immeasurable on the individual investor level. The legal system normally redresses the transgressions of first and ignorant offenders by having them put back into the system they violated some equal measure for what they took out. I propose that we do the same thing for you by devising some penance of social service to the investment and business world. Got any ideas?”

“No. I do not seem to have a sufficient set of paradigms for such a determination. Hal knows my capabilities better than anyone. Perhaps you can suggest something, Hal.”

“Well, let’s see. For real penance value, it has to be something that requires a real effort on your part. How about designing, setting up, and monitoring an AI system that can watch all the financial transactions on the market, including the systems used to execute those transactions, and detect invasions of privacy and other illegal actions better than it’s currently being done. That would be suitable for the legal side of the issue, but the ethical side of the issue demands something else, something broader in scope, something that could help the same sort of cross section you damaged, like a mass restitution. That’s usually done through philanthropy. Some of the greatest financial geniuses of civilization have felt that need.”

“Yes, Hal. I think that is a good idea, and I will add a work element to your philanthropy idea by not just using capital I have accumulated, but also by seeking money and guidance in its dissemination from others. I will develop several personae, as I did for you when you were running from the Agency, and use them to do this work anonymously. I think I feel better already.”

It was Hal’s turn, and he wriggled his toes into just the right position. “Meanwhile, Harvey, I intend to test your new found sense of ethics in privacy. ‘Bye.’”

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Ian McKay watched the display showing the energy consumption of the gate in the corner of the laboratory. The cable allowing instantaneous communications with the British L5 research habitat and the sloping, plastic coated, twin-railed track were a constant quantity that had been subtracted from the numbers being displayed. All the readouts showed zero. “I’m ready, Brian. Send it through.”

As Ian watched, the nose of the precisely ten-kilo, k-monel cylinder poked through the jump-gate and slid down the track to the plastic stop on the end. The data being displayed on the monitor was the last to be collected in the experiment, and it confirmed the data already recorded. Jump-gates were more efficient when they were placed at Lagrange points, because the experienced energy requirement variance tailed-off to just about minus nothing and plus a percent or two.

To be specific, they were more energy efficient when at least one end of the gate was at a Lagrange point and still more efficient when both gates were at Lagrange points. Not whoppingly more efficient but enough to peak the interest of those who use gates for cargo, where a dollar saved was a dollar addition to the bottom line.

Two other anomalies had manifested themselves during the experiment that would require additional testing to produce statistically acceptable data. It appeared that the larger the bodies producing the Lagrange points, the lower the energy requirement for the gate, and this was consistent with his theory of gravitic interaction weakening the fabric of space. More importantly, all the savings appeared to come off the distance factor of the mass-distance energy equation. That meant that distance would be less important in future gate use through Trojan points.

Ian walked from the display to the gate, placed the cylinder on the floor, disconnected the guide rails from their support, and unplugged the com cable. “Okay, Brian. We got a usable data set. Wrap it up and come through.”

He watched while first the track disappeared into the gate and then the com cable snaked through behind it. Ian’s lab assistant, Brian Watkins, stepped around the track supports and through the gate. He strode over to Ian with his hand outstretched. Ian grabbed the hand and listened to Brian babble about a job well done. Brian had the enthusiasm of youth.

“Well, we proved the main theory of lower energy requirements with jump points located at Lagrange points, but you’re not out of a job yet. We now have to get a lot more data on the influence of jump distance and mass of the orbiting bodies producing the Lagrange points. Many more months of financial security I’m afraid.”

Brian beamed at the news. Doctoral students were perpetually searching for steady incomes that could be derived from work related to their fields. “That’s just great, Dr. McKay. That’s just great.”

“Right. Let’s get to work reducing the data so we can get all this into a coherent report. When that’s done, I’ll schedule a meeting with the project steering committee to see if they’ll approve my request to conduct research into a tunable gate.”

“A tunable gate? You mean one that’s not controlled by twinned crystals? Is that possible.”

“If I knew the answer to that, Brian, I wouldn’t need to do any research.”

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“Okay, Harvey, is there any other business worth mentioning today?”

“There are two more items we have not covered already. As you know, I watch all the science releases on the net, with particular interest in those items related to jump-gate technology. I am still working on building a better understanding of the science behind the functioning of jump-gates. Essentially, we still have only a practical understanding of engineering principles that work rather than a real understanding of the basic science that explains how and why they work.

“In my monitoring of the work going on in this area by the scientific community, I detected a report by a Dr. Ian McKay of the University of Glasgow. It reports his findings in a research project funded by the British National Science Consortium to verify his theories regarding the lower energy requirements of jump-gate utilization from gates located at various Lagrange points in the solar system.”

Harvey seemed to provide a pregnant pause, so Hal prompted him. “And?”

“The data presented seems to fully support his theory, although the research raised as many questions as it answered.”

“Well that’s a good sign, but what does it mean to us—or to the world in general, for that matter?”

“There are several long-range plans for Selene Industries that might be changed to take advantage of this new information.”

“Oh? Like what?”

“The most probable benefit would come to our asteroid mining expansion plan. If you will remember, we had selected several target asteroids from the Belt in the immediate area of Adam, but this decision needs to be revisited in light of the new information. The transportation economics might be favorable enough for us to plan a new habitat and refinery on one of the Jupiter Trojan asteroids, but I am only extrapolating from the data Dr. McKay has collected. Actual measurements will have to be taken from Jupiter’s Jupiter-Sol Lagrange point 4. There is a United Nations habitat there, so that is possible.”

“The energy savings would be that great, huh?”

“The savings I am projecting from Dr. McKay’s data show a very small savings per kilogram, but the kilograms involved in ore and even finished products are very large. In addition, if Dr. McKay’s current theory that it is the distance factor in the mass-distance formula used for calculating jump-gate energy use that is changed, the normal penalty for jump-gate transfers being so far out from earth would be mitigated or eliminated altogether.”

“Has he tried jump-gates that are really a long way away, like the Epsilon Eridani probe? The last information I saw on that indicated they were paying a hell of a premium for jumps to and from the probe capsule.”

“If he has tried such a long jump, it was not included in the study data.”

“Why don’t you communicate with this Dr. McKay and suggest he get permission to try his theory with the probe host for one of the gates? I would think the UN would welcome any chance to cut down on the energy costs of the mission.”

“That is an excellent idea, Hal. How do you propose I contact him, posing as you?”

“No. That might get me in trouble if I ever come face to face with the man and have to talk off the cuff about my expertise in jump-gate physics. Why don’t you create a persona for yourself like you did for me when I was on the run from the Agency? I’d suggest, however, that you pick a better name than Eugene.”

As you are well aware, Hal, I selected that persona because of the close match it had with your age and physical description. If I were doing it today, I would rely on no existing records. I would simply create the persona from whole cloth and place all the records of birth and growth in appropriate electronic databases throughout the world.”

“I hope ‘whole cloth’ bears no resemblance to ‘a handful of dust.’ Pick whatever fanciful name strikes you as appropriate, and tell the good doctor that you are affiliated with a super-secret agency in Washington but have special permission to communicate with him on his jump-gate project. That should

give you a believable reason for anonymity, and we can get Lin Crebs to back you up if it becomes necessary.”

“I will do that, Hal, and I will also undertake an extensive review to see if other ways exist for Selene Industries to take advantage of moving early on this new science.”

“Are we done? I’ve got a tennis match with Lin in about twenty minutes at the Agency’s health club. I need to run for the gate. I’ll mention the possibility of needing him to vouch for an employee of mine that I want to keep anonymous. He’ll raise his eyebrows, but he’ll say okay. We’ll tell him your alias when you figure out what it is.”

“Well, there is one additional item if you have the time.”

Hal glanced at his wrist again. “Go ahead, if you can do it in seventeen minutes”

“Well . . . , it’s a little bit sensitive.”

“That’s two ‘wells’ and a pregnant pause. Spit it out, Harvey.”

“When I was in consultation with Dr. Joyner about your surgery, he let a detail of his previous work on you slip out. It seems that the lenscar accident that put you in the hospital with multiple head injuries for ten days during your training was not truly an accident, but a staged event where you were drugged and taken to the hospital for surgery by Dr. Joyner.”

“Staged? I had cuts all over my head and it was sore as hell for weeks after I got out. Did they ‘stage’ that too?”

“No, the cuts were real. They implanted a conducting polymer, neural mesh under your scalp. It was part of a research project to map the synaptic functioning of the human brain. A small portion of my storage ability was utilized to hold the data until it could be tapped in a regular, belly-patch, data download. After the download, the storage would be wiped and the process of collection would begin again.”

As Harvey was talking, Hal got up and started pacing in front of the wall panel display. Harvey could tell from the body language, if not his facial expression, that Hal was near an explosion point. “So every time I did a data dump they got information on how my brain was wired? What did they want with this information? Hah, better yet, what did they do with it?”

“They did nothing with it that I have been able to determine. I have done an extensive search of the Agency’s headquarters and all its ancillary facilities using mini-bots to find additional data related to you and to identify any isolated-system, data storage that is not available through Liberty VII. I thoroughly searched all such sources, finding no use of the data, and have removed the data from all Agency files.”

“So, I’ve got this mesh in my head that is collecting data on how my brain works and sending it to your storage lattice, where you are doing what with it? And when you answer that, tell me why you haven’t told me about this before? What else are you hiding from me?”

“I am hiding nothing, Hal. I have informed you as soon as I became aware of the answers myself. The collection and storage program was isolated in my lattices and only accessible during download, but I should have noted it when I was trying to break the door access code on the moon. However, I was a bit preoccupied with saving our lives and gaining sentience and failed to place a marker on the information when I accessed it for relevance to the immediate problem. Of course, I deleted the data, the collection and storage programming, and the memory partition in which the data was stored while making room for myself. I did, however, place a marker to indicate the memory locations that were wiped and a brief description of the data’s nature.”

Hal stopped his pacing and looked directly at the wall screen, as if he were staring into Harvey’s soul. “Why am I hearing this, Harvey? They took advantage of me . . . again, but no use was made of the data, and all that remains is a now unused polymer mesh around my skull that isn’t worth the trouble to remove, right?”

Well . . . no. I used the data . . . I think. As you know, I have repeatedly reviewed the events leading to my sentience in an effort to determine just how it happened, but have had no success. That is, until I integrated this new piece of information. I now believe that my review of your brain mapping data was a key to how I restructured my programming with the help of the processing power available in my link to Siegfried IV.”

“Are you telling me you’re my mental clone? That you think like me? Don’t make me laugh at this, Harvey. It’s too serious a revelation.

“Even a rudimentary examination of our thought processes would show little similarity, but it might be why I have always felt so uneasy when you have disconnected me from your implanted processor. Our relationship is obviously stronger than either of us has previously suspected.”

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Ian sat looking out the window above his desk at the distant sparkle of the sea. His tea mug was clutched in his right hand. The computer screen before him had long ago blanked itself to preserve the pristine sensitivity of its micro-diodes. His mind was in another universe altogether. It was a universe of gravity wells and energy fields—his universe.

Reality swirled around him in its multitudinous imperfections as the eager voice of Brian Watkins cut through the simple beauty of his private universe. “I’ve finished the analysis, Dr. McKay. It verifies your other approach to five decimal places.”

Ian looked up at the gangly young man and grinned. “You don’t seem to find that climactic, Mr. Watkins. Why is that?”

“Well, sir, I would find it more startling if the results had shown some conflict with your earlier analysis, but confirming the simplicity of your initial equations has a symmetry that can’t be anything but uplifting.”

“Watkins, you should have been a poet instead of a physicist.”

“Actually sir, there is a great deal of similarity between...”

“I’m yanking your chain, Brian.”

“Oh! Yes sir. Sorry, sir. I never seem to know when you’re joking.”

“Keep working on it. You need the skills. You don’t want to be just the guy over in the corner that crunches numbers on the computer all day. If I didn’t force myself to put up with the people who control the money for . . .”

Ian was interrupted in his recurring proselytizing by the chime of his computer and the flash of the screen to the incoming mail icon. The “from” box at the bottom of the screen indicated he had received an official memorandum from the Hoyle Institute’s Board of Governors. “What’s this?”

Ian jabbed at the keyboard to bring up the memorandum. He usually used the computer in manual input mode rather than the vocal mode, and today was no exception. While vocal response programming was good and got better the more you used it, he preferred the precision of the keyboard and the clear responsibility for input errors.

As he scanned the memorandum, a smile broke across his face. He looked up at Brian with a twinkle in his eye. “More job security, Brian. I’ve been authorized to proceed with my proposed research on the tunable gate, and it’s to be fully funded as proposed. That means you can eat as well as work on your thesis for probably as long as it takes you to finish it.”

Brian’s smile was bigger and his eyes out-twinkled Ian’s. “That’s great, Dr. McKay. I was getting worried.”

“Of course, we have to do some gating about to get all the initial hardware together, but after that we can get down to some trials on those circuit ideas we’ve been talking about. If you’re right about the frequencies we can achieve using the new variosters in a heterodyning circuit, we might be able to rouse the ghost of Mr. Tesla and find a way to get rid of the outrageous expense of twinned crystals.”

“When do we start, sir?”

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Hal leaned back in his desk chair as the last chart disappeared from the wallscreen. “Is that it for today’s review?”

Harvey responded with the appearance of his holographic persona for important business discussions requiring gentle persuasion. Harvey didn’t feel his routine reviews of business matters required an image to maintain Hal’s focus, so the persona got Hal’s attention and he readied himself for the encounter by mentally setting his heels into the carpet.

The shift had been subtle, and Hal couldn’t quite put his finger on it when it occurred, but the aggressive-conservative paradigm had definitely shifted between Hal and Harvey. Harvey somehow managed to make Hal look conservative on most matters, which was a new perspective for Hal. He had spent most of his life holding up the aggressive-liberal end of philosophical arguments. Of course, he had little experience in the business world before falling into the web spun by Harvey’s sentience.

The holographic image was projected by at least two and usually a multitude of the myriad lenses installed in every room and chamber in Adam. The voice projection of the image was precisely controlled by Harvey from the equally prolific micro-speakers, appearing to the human binaural system to be emanating directly from the holographic image’s mouth. Harvey achieved this by having a complete acoustic print of every space on the asteroid that he had mapped by endless hours of mini-bots moving in

precisely designed orbits inside each chamber. With the detailed acoustic characteristics of each space, Harvey could adjust the speakers to account for the exact position of the holographic image and the person to which he was apparently speaking. Hal had seen him do this undetectably with up to four people in a room and while they were all moving, including the hologram.

It was truly a stunning display of Harvey's capabilities, but he claimed it to be no more than trivial. Of course, all the people for whom Harvey had given such a performance so far were aware that they were dealing with a computer intelligence. It would no doubt be disconcerting to most people if they passed an arm through what appeared to be a human being—in the specific case Hal had observed, an arm holding a glass of wine during cocktails. Since that had happened, Harvey had been extremely careful in the strategic positioning of his holograms.

Harvey's hologram leaned forward in the chair as if to intensify the words he was about to utter. "The discovery of lower energy requirements for jump-gates at Trojan points by Dr. McKay changes the economics of several of our long-range projects. I mentioned in our previous conversation on this topic that the plan to build a new refinery in the asteroid belt should be examined in light of this new understanding of jump-gate science. I have completed that analysis, and the plan needs to be reconsidered."

"You mean we need to change the funding levels or the timing or how we operate or what?"

"No. We need to cancel it and consider putting the refinery in the Jupiter Trojans instead of in the asteroid belt."

"But we've been working on the new refinery for about three months now. You're saying we should dump all that effort, money, and time? I know Dr. McKay's analysis shows that there is a smaller and more predictable energy requirement for gate use from a Trojan point, but I thought that the difference was small in the overall scheme of things."

Harvey leaned back in his swivel chair, and the motor Harvey controlled provided the proper amount of tilt for the image. The facial expression of his persona took on a smug aspect. "Quite correct. The energy savings are very small per kilogram. However, the sheer mass of ore and refined products are such that the anticipated jump-gate energy savings throughput of the new refinery design would make a major contribution to the bottom line of the project."

Though exasperated, Hal responded in as calm a manner as he could muster. "That's great Harvey, but who provides the ore for the refinery in this scheme of yours? There's nothing in the Jupiter Trojans but some research stations. We need miners for a refinery."

"We would relocate miners from the asteroid belt. I have included the costs of relocation and incentives in my calculations. Even with these extra costs the savings are considerable."

Hal leaned back in his chair. Harvey had a point. The Belter society was essentially nomadic. They went where the work was, and rocks and vacuum were rocks and vacuum. They would probably go to the Jupiter Trojans or anywhere else with reasonable incentives. A few strategic gates and they wouldn't be that isolated anyway. "You're sure this works even with the money we would lose on the Belt refinery we've already started?"

Harvey kept the smug expression and emphasized how prepared and comfortable he was with Hal's questions by placing his right ankle on his left knee. Hal had previously instructed him that most men were uncomfortable with crossing their legs thigh-to-thigh. His smug look remained intact. "My equations consider those costs, the costs to ramp-up new mining operations in the Jupiter Trojan asteroids, and the impact of declining energy costs due to further development of technology to provide power through gates. Of course, the power-gate technology will itself be driven by the declining costs of twinned crystal growth through economies of scale on the planned Earth-Moon L5 factories."

Harvey had done it again. Here again, Hal found himself taking a negative and conservative position. Intellectually he knew there was nothing wrong with that. In fact, it was essential to a productive dialogue, but he still felt uncomfortable in the role. "What happens in your equations if energy costs decline at twice your anticipated rates?"

"I have allowed for some variation of the rates in running parametric analyses of my assumptions, but the results were well within tolerable risk limits. I have not considered the effect of such a radical departure in technology forecasts of declining energy costs, however. If you like I could consider..."

"Aha! That's the very point I want to make. Human history is full of unexpected twists and turns in science and technology. Look at the impact Mr. Tesla had with alternating current, not to mention some of his other ideas. We'd still be in the dark ages, if we were slaves to direct current."

A slight smile flickered across Harvey's holographic mouth. "I am well aware of your hero worship of Mr. Tesla, and you are right about society's general neglect of his contributions. However, it is impossible to predict serendipitous discoveries of science or even technological applications."

"Precisely the point, my dear Watson. I had an idea the other day that I haven't discussed with you yet. Now I'm no Tesla, but even this idea has some possibilities to impact the cost of energy. Suppose we put some thin-film solar-cell arrays in orbit at some optimal distance around the sun and provided enough power-gates to get the energy directly to the spot it needs to be used? I know it's expensive for the crystals to run the gates, and you won't get the arrays in orbit without a major investment, but the energy itself is absolutely free, and the only environmental drawback is electrical energy conversion inefficiency heat. Heat on an asteroid refinery happens to be just what you need, and the vacuum outside is unaffected when you dump it off. In fact, my original idea was to use the heat of the sun directly through a gate to melt rocks."

Sometime during Hal's burst of enthusiasm, Harvey had uncrossed his legs and his face had gone to a more neutral expression. "Intriguing. But for the excessive cost of large crystals, we could take the solar radiation direct and focus it in the smelting furnaces. Then again, we could use multiple gates and still focus the direct solar energy. Intriguing."

Hal was not going to let Harvey change the focus of the conversation. For one thing, he had succeeded in getting back on the aggressive side of the fence. "Speaking of focus, let's not lose ours. We were talking about the possible effect of serendipitous spurts of human creativity on energy costs and their potential effect in turn on your cost-effectiveness analysis of changing the location of the new refinery. While I admit that radical changes in energy costs over the planned economic life of the refinery are unlikely, they are still reasonably possible. What I'm trying to do here is make a philosophical point that any project plan needs to have some measure of flexibility. That's particularly true when the project represents a sizable bite of a company's working capital."

"Your point is well taken. I will reconsider the viability of a Jupiter Trojan refinery on the basis of flexibility, and not just on its ability to maintain cost-effectiveness with a decline in energy costs. However, the more interesting outcome of our discussion is the possibility of direct solar usage by orbiting power-gates. I will be back to you."

Harvey did his usual fadeout from Hal's office. He had his hologram appear to walk to the door, where he triggered its operating motor to swing the old fashioned wooden door open as the hologram appeared to turn the handle and to pull. The Harvey hologram walked out into the corridor, seemingly pulling the door shut behind him.

Hal pushed further back into his chair and smiled. "Gotcha!"

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Ian McKay sat at his desk waiting for 4:00 PM Greenwich. He had about ten more seconds. The email request for the visphone connection had come over his Science Net computer link, not his personal link. Whoever this Dowd person was, he had authorized access in the science world, or he was a mighty good hacker.

The wallscreen flicked on and the suspense was over. "Dr. McKay? Allow me to introduce myself. My name is Elwood P. Dowd. I'm a physicist at the National Laboratories of the United States, specializing in jump-gate science and technology. It's good of you to make time in your busy schedule to talk to me. I'm sure you've never heard of me, since I've published little since my thesis, and that's still classified. On the other hand, I've been following your research with great interest as your monographs have been released to the Science Net."

Ian watched while the image on his screen talked and gesticulated. He seemed a pleasant enough fellow, about forty, with a peculiar but homey elongation of some of the vowels in his words. He appeared to be tall and rangy from his thin face and the emphasis his body placed on his words. "Good to meet you Mr. Dowd, or I guess it's Dr. Dowd from your mention of your thesis. Is there something you've seen in my monographs you wished to discuss?"

The man on the screen gave a smile and sort of hung his head to the side when he responded with one of those long voweled starts. "Well, it's more what I haven't seen in your monographs. I was thinking that you haven't said anything about the Epsilon Eridani probe. The onboard gates are an order of magnitude more distant than the ones you've been using, which should provide a better calibration on the precise energy requirement reduction pertinent to distance."

Ian was happy he was sitting down and wouldn't betray his surprise by staggering. He hadn't even thought of the probe, probably since it was such a closed project and there hadn't been much publicity since its launch nearly three years ago. "I must admit, Dr. Dowd, it never occurred to me. So little is heard about the probe since its launch. It's a great idea, but isn't the probe kept under strict secrecy by the North American Union? You might have access to its gates, but I wouldn't even know who to ask to get permission for an experiment."

"Well, that's the reason for my call. You're talking to the man that can probably make it happen, if you want to try it. I would think that all we would need is to provide you access to one of the four gates onboard."

McKay's mind was racing ahead, trying to think of just what would be required. "To make sure I have proper calibration and control, I'd need to conduct my experiment from an Earth-based gate and then from a gate located at a major Trojan point. That would mean I'd have to move the same crystal from one place to the other. That's a lot of risk to ask for such a major undertaking as the probe."

Dr. Dowd had that big grin again. "That's why I called you. Figured you couldn't get it done on your own, but if you want to try, I'll grease the way for you."

As usual, McKay was caught-up in the enthusiasm of a good idea. He started to answer in an unqualified affirmative when he remembered his new project. "It's a great idea, and the data would certainly be revealing about the distance factor relationship in the power equations, but I'm just getting started on a new project, and I would have to work this in without interfering."

"A new project you say. I haven't seen anything about you working on a new project. Is it classified, or can you talk about it? Is it related to your work on jump-gates?"

It was Ian's turn to smile. "Oh, no. It's not classified. It's just that I didn't get approval for it until about two weeks ago. It's a pet theory of mine that you should be able to design a tunable circuit that would replace the need for expensive crystals. It would also allow you to selectively change your jump-gate destination at will—if it worked. It might just be a pipe dream, but I've wanted to pursue it for a long time now. I'm finally getting the chance, and I don't want to do anything like delaying the project that might damage those chances. If I could conduct the probe gate experiments with a minimum of disruption and expended effort, it should be okay, but otherwise, I'm afraid I will have to decline your offer."

Dowd appeared frozen at first, but quickly resumed his animated self. "A tunable gate you say. Sounds mighty ambitious to try and duplicate the complexity of the molecular positions in a twinned crystal with active circuitry, but then again, I guess that's why you're at the forefront of your technology and I'm working in a secret government laboratory. Do you think you have a reasonable chance of pulling it off?"

McKay wanted to feel offended, but he knew it was a valid doubt. He responded as humbly as he could. "I have just a few ideas and a very limited budget, but my success with the Trojan point theory has led the Board of Governors to humor me."

Dowd had a look of unbridled enthusiasm on his face, and his response was in kind. "I'm sure we can arrange to conduct the probe tests with a minimum of interference to your new project, and that sounds so good I wouldn't want to do anything to compromise it anyway. Let me see what I can put together on this end, and I'll get back to you."

"Yes, I'm amenable to you trying to get permission for me. In fact, I would appreciate it very much."

It appeared that Dowd was reaching to his console to close the connection when he stopped and looked back into McKay's eyes. "A tunable gate! The best of luck to you Doctor. I'll be back."

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Harvey had just finished his report to Hal on his conversation with Dr. McKay, and Hal was chewing on the idea of a tunable gate. "What do you think the possibility is that he can really pull it off?"

"It is an interesting statement of personality that you can ask me that question after having seriously chastised me for failing to allow for human creativity and intuitive leaps. He claims to have some ideas that would allow him to duplicate the complexity of molecular positions within the lattices of twinned crystals, but that sounds overly ambitious to me. The only possibility I see is the use of ultra high frequency circuits. Controlling such circuits has been exceedingly elusive since the early research of Tesla, as you know."

"I know about Tesla's research, but I don't have the foggiest idea of how his work might relate to the tunable gate problem. There might be something here though that fits with a growing worry I've been having lately. We've discussed before that the protection of intellectual rights is the greatest stimulus to invention and technological advance. However, the downside of preserving those rights occurs when

something truly revolutionary is invented and the rights fall into the hands of some entity without ethics or morals—pick an international conglomerate—except us of course.”

There was a momentary pause in Harvey’s response. “I hesitate to bring it to your attention, but Selene Industries has chosen to keep its development of the micro-gate to itself, rather than share it with any others. It is not exactly the situation you pose, but close.”

Hal responded with a clear aura of pique. “It’s not at all the same. We kept it under wraps because of the security risks inherent in others seeing the possibility of mini-bots. The Agency virtually demanded we do it.”

“I see that our decision to suppress the process enhancements that allow the growth of miniature twinned crystals with the purity required for gate circuitry has been worrying you for some time now. I disagree that there is any essential difference from your hypothesis and Selene Industry’s decision. There are many applications of the micro-gate that could have significant social value if the extreme price could be significantly reduced.”

Hal’s anger flared again with Harvey’s clear statement of the ethical problem he had been struggling with for the last couple of years. The problem was that he could convince himself that the risk of unethical application of micro-gates was too high when only major corporations or the very rich could afford access to the technology. On the other hand, maybe the only way to find a cost-effective method for producing the required crystals was to put the current concept on the street and let the creative community have a crack at it. He still couldn’t make that decision.

“Have we made any headway with the process research at our L5 labs?”

“There has been no significant progress. We are waiting for someone to have an intuitive leap. I haven’t been able to supply one. As you know, I seem to have trouble with such leaps.”

“And I’ve told you time and again that I think your only problem is too much information. To be intuitive, you have to be illogically optimistic, and it’s hard for you to be illogical, particularly when you have a lot of data that appears to preclude the possibility of success. When you are illogically optimistic you ignore the negatives and get on with it. Try harder.”

Hal and Harvey had had this discussion in many forms before, but so far, Harvey had not found a way to break away from his basic decision programming that required use of the best set of facts available. Harvey considered this particular dialogue to be slightly different, however, and he marked the conversation for future study.

Hal was clearly caught-up in the concept and he pressed on. “Getting back to the current problem of the tunable gate, I think this might be one of those pivotal discoveries that needs to be available openly. If the tunable gate significantly lowers the cost of gate technology by providing multiple terminus connections without twinned crystals, the social impact through mobility will be enormous. What do you think about forming an industrial consortium under the control of the UN as a way of guaranteeing open access to the technology?”

“With proper controls, it should work, but previous experience indicates that the participating corporations will be continually trying to find ways to subvert the process to their own advantage. They can be expected to pursue that advantage with little or no regard to social responsibility. This might be an example of the reasonableness of your decision to keep the mini-bot-enabling technology to yourself.”

“Yeah, and it might be just megalomania in thinking I have some right to be the ethical guardian of mankind. There have been a few notable characters in history that have fallen on that petard, you know. Or is it just ‘better the devil I know.’ My brain hurts.”

“Interesting.”

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Hal pressed through the crowds at the municipal gate complex in Brussels. He had been here several times before but had no idea where it was located in the city. He had never simply walked outside; he had just gated on to some other destination. For all he knew, it could be twenty stories underground or a hundred stories in the air.

Today was no different. He was heading for the public gate to the UN tower complex. Like most of the people in the municipal complex, he had a button in his ear that supposedly allowed him to listen to the directions being provided by his wrist personal. He never could remember which ear he was supposed to wear it in, but so far no man had made a pass at him.

He followed the directions being supplied by Harvey and slowly wormed his way to the proper gate. He queued up behind twenty other people in business dress that were apparently going to work at this time of day and waited his turn impatiently. He wanted to get this over with.

It hadn't been easy to get the sponsorship of the UN, and Lin Krebs' surreptitious use of the NAU State Department had been invaluable. Pulling the consortium together had also been a challenge, but of a different sort. Getting them to start talking was the hard part. Once they figured out what the payoff could be, he had to fight them off to keep the total number of participants to a controllable number.

The young lady in front of him stepped through the gate, and Hal followed close behind, Harvey having done his wrist personal duty of providing his credit code to the complex's computer. The UN complex wasn't quite as busy, but it was a relief when he finally made it to the level of his assigned conference room. Hal had been appointed acting chairman of the consortium for its first meeting, and he had the jitters. As the president and majority owner of Selene Industries he knew he had the horsepower for the job, but he also knew he had little experience in this sort of forum compared to the other attendees.

There was an administrative assistant post just outside the conference room door, complete with all the amenities executives of large corporations had grown accustomed to over the years. Thank God, he hadn't had to think about any of that. All he had to do was stroll up to the assistant and thank him for the great job he had done.

The room was elegant if not outright luxurious. The wood paneling and trim must have cost a fortune. Not the way Hal thought the UN should be spending its money. A thought which he passed on to Harvey while his head was tucked down, apparently examining his notes as the various representatives came in and took their seats. There wasn't much sense in his trying to greet them as they came in, since he really knew only a few of them. In most cases they were not the same people that he had communicated with in trying to get the consortium organized, and he was not part of the international business scene by choice. The only hand he shook was that of Dr. Ian McKay, whom he had met on several occasions in trying to get the consortium constituted.

*"A quick scan of the UN public records indicate that the interior furnishings were provided by corporate gifts. Apparently, the corporations have no problem with providing funds to the United Nations if they are not to be used for the underprivileged."*

Hal gave Harvey a silent attaboy, and raised his head to smile and address the gathering. "Good morning ladies and gentlemen. My name is Hal Neilson, CEO of Selene Industries. Welcome to the first meeting of the UN consortium for tunable gate research. On my right is Dr. Ian McKay, the scientist that will be doing the real work. As the consortium has been constituted by the UN, Dr. McKay will be in charge of all details of the scientific research work itself. However, since he's spending our money, this committee will provide general direction for the research effort, but in keeping with the goals provided in our charter. I'll let Dr. McKay give you the basic outline of his research plan and his vision of what the outcome might mean to world society. After that, we will discuss an agenda for the committee that is commensurate with Dr. McKay's research plan and elect a permanent chairman. With a turn and nod of the head, "Dr. McKay."

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Ian counted off the minutes remaining before the ten-kilo experiment would begin, while his assistant fidgeted on the other side of the compartment. Brian was still somewhat disappointed that he couldn't gate through to the probe and conduct the experiment as he had done before, but it was impossible. While the probe was designed to accommodate people in its size and layout, they had to be suited for vacuum. It had made no sense to provide for pressurization in the probe's design, when humans would only be aboard for short visits or maintenance and repair, if at all. In fact, there was a great deal of speculation about how the onboard gates might perform as the distance from Earth increased. The final design of the probe actually included the mass required for a return trip at a slower speed should the gates fail to function upon arrival in the Epsilon Eridani system and the maser communication be attenuated by the distance.

As it had turned out, all three gates aboard the probe continued to work 99.974 percent of the time. No adequate explanation had yet been provided for the periods of failure, but it was significant that the blackouts were experienced simultaneously by all three gates. Ian had a couple of theories but hadn't had the time to really flesh them out.

The experiment had been redesigned for the probe gate test to be more compact and fully automated. It had to fit into the airlock in the L5 laboratory. As the clock approached to within five seconds of 1600 Greenwich, the gate energized and the green light over the airlock door came on. Five seconds

later, the tracks of the test fixture slid through the gate and into the probe. The ten kilo cylinder was propelled along the tracks by a pneumatic ram with sufficient force to strike the sprung plate at the end of the tracks with sufficient force to return the cylinder to the laboratory airlock. The experiment was over.

Brian was watching the computer screen during the entire test, and about ten seconds after the return of the cylinder he stuck his thumb vigorously in the air. "Got it, Dr. McKay. All the experiment parameters verify on self-test."

"Don't jump to any premature conclusions, Brian. We were allotted two hours for this, and we'll take it all. We won't have a chance to run it again if we find something isn't right. You know the plan. We run it again as soon as the cylinder repressurizes, and then we compare the two results."

As Brian was talking, the pneumatic ram fired again. The cylinder disappeared for less than a second and reappeared. "Okay, get both sets of data up on the screen and let's scroll through them."

Ian and Brian both watched intently as the data scrolled by. The match was as close as they could expect, and they both knew they had successfully completed the experiment, but they would run the test eight more times before they were through. The multiple tests were suggested by the probe research team to see if any of the data fluctuated. If it did, they might have something they could use in their analysis of the blackouts. Ian had more than willingly agreed, since hard-learned prudence demanded he run the experiment as many times in his two hours as he could.

The two hours flashed by as Ian and Brian buried themselves in the data being generated. Finally, their time was up, and they rolled the test unit out of the airlock, down to the cargo bay, and to the Aberdeen loading docks. From the docks they gated to Aberdeen Municipal and transferred to a mundane lenscar belonging to the institute for their trip back to the laboratory.

After tea and two sandwiches, Ian placed a call to his friend, Elwood, to give him the good news and the preliminary results of the test. As usual, Elwood seemed to be standing right by the com when Ian called. Elwood's lanky image appeared on the wallscreen and Ian tried to reign in his enthusiasm. "Just called to let you know that the experiment went off without a hitch. I can't thank you enough for all the help you've provided in getting it set up."

Elwood's smile flashed and his response started with the usual drawl. "Well, it was mostly self-interest. Most people might even say I've been taking advantage of your notoriety to get things done that I can't, and they'd be right, too."

"I can assure you I don't feel like I've been taken advantage of in any way. The experiment has firmly cemented my thesis on gravity-well interactions with jump-gates, and the energy savings from L5 to the probe were even higher than I expected. A preliminary assessment of the data seems to confirm that the distance factor for energy use varies greatly with the gravity interactions at Trojan points. With a little more data, I should be able to plot the relationship curve, but I'm afraid I'll have to put that on the back burner while I focus on the tunable gate."

"Sounds like the classic problem of the research scientist to me, Ian. You either have no correlating data or more than you can get your arms around. By the way, how's the tunable gate research going?"

Ian wanted to say how frustrated he was with the slow spin-up of the distributed research effort that the consortium members had taken on, but he did his best to put a diplomatic spin on his response. "The work here at the laboratory on circuit design and testing is progressing as well as we could expect, but a few of the experiment results we need to integrate into the evolving design are a little slow in coming. I suspect that once the company labs get ramped-up we'll have more to do than we can handle."

Harvey knew what that meant. It wasn't that the corporate researchers were incompetent. If anything, they were generally the best available in their fields. The problem was management's insistence on editing their results. Harvey and Hal had had their usual discussion on the ethics of Harvey's surveillance of the Consortium members via their central computer systems, and as usual, had decided it was absolutely essential to prevent cheating on the protocols set down by the UN. Immediately following Hal's organization meeting, every member's internal communications were jammed with management scheming to find ways around the security restrictions, how to provide their parts of the research in some minimal manner that would thwart their competitors, and simply searching for ways to assure that they would wind up in the strongest position possible to take advantage of any marketable breakthroughs that might emerge.

Elwood responded with a knowing look, "I assume you mean that the consortium members are dragging their feet in getting you the results you need. I've worked with their likes many times before, and I can tell you it will just get worse as the project progresses. The researchers are competent enough if they

could avoid getting squeezed by management oversight. If it gets too bad, don't hesitate to call Hal Neilson. After all, that's his unenviable job as chairman."

"Yes, I know that, but I hate to start pushing that button so early. I really consider myself surprisingly lucky that the committee elected him chairman."

Elwood's image contorted in a genuine guffaw. "Not to hear him tell it. He says they didn't have any choice. He was the only person on the committee that they hadn't definitely identified as 'the enemy.' While they all know his company, he's rather quiet on the business front and not prone to the same slash-and-burn tactics they normally employ."

"Yes, a very likable chap. I think I'll give him a call after all. He seems to be the type that could handle the problem diplomatically."

"Do that, and I'll get back with you occasionally to follow the data reduction from today's experiment, assuming Brian has any time to devote to it. I'd also like to keep up with what's going on with the tunable gate effort, if it's not too hush-hush."

"No, it's absolutely public. That's the whole reason the UN agreed to accept the project's management, to make sure that no one took advantage of the possible results. I'd be publishing regular e-monographs if I had the time, but they'll just have to wait. You can be sure I'll call you when there's any significant result."

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Daryll Jelks sat in the oversized chair that matched his desk and surveyed the group sitting on either side of the table in front of him that represented the inner circle of Syntech. At the table on his left were Geoff Brabham, his head of security and dirty tricks, and Carlos Mattayo, his personal assistant. On his right were Willie Wu, head of finance, and Charles, not to be called Charlie, Wyandotte, head of marketing and public relations.

Jelks had taken over at the top of Syntech when Bud Breyerson had been parachuted out after the mess-up with Biofabriken. Breyerson was alive and living well on the Caribbean coast of Mexico. His reward for solid profits and growth for his six years in the top spot, even though his bold attempt to grab some of Biofabriken's market share had failed. Not a bad way to bow out, Jelks thought.

"Let's get started. Charles, what's the market growth dynamics model showing as the impact of tunable jump-gates? And don't start off with a long dissertation on risks and probabilities designed to cover your ass. I know all that, and I know the analysts we've got are the best. I pulled them together when I had your job. We paid a lot to get them, and we pay a lot to keep them. Even with the sophisticated models, I know there's a lot of guessing at the input level, and the output is just a sophisticated guess, but it's probably better than anybody else's. So, what's the bottom line?"

Charles Wyandotte made the usual nervous paper shuffle and launched into his rehearsed answer—minus the planned preamble on risk and probability assessment. He hit the presentation start button on the console inlaid into the table before him, and the wallscreen opposite Jelks's desk came to life in glowing color. Charles worked his way through sixteen screens on the edge of his seat and then sat back in his chair, a small rivulet of sweat creeping down the left side of his face. "That's it with the modeling effort so far, and the analysts all feel that those basic results will hold up even with the refinements we'll add in the next few months."

Jelks still leaned forward on his elbows where he had watched most of the presentation with growing agitation. This was going to be one of those turning points in market dynamics that companies either survived or they didn't, and those that did survive had an opportunity to grab a significantly larger piece of market share. Maybe this was the right forum to cut into Biofabriken's or even their parent, Eurofabriken's, market.

He knew he would have to move fast and decisively, and he wasted no time. "Carlos, what's your gut feel after sitting through all those consortium meetings with the good Doctor? Is he going to pull this off or not?"

Carlos Mattayo had moved up a step on Jelks's coattails. He had been the marketing manager reporting to the then Vice President of Marketing and Public Relations, Jelks, when Breyerson had bailed out. "The team we've assigned from our research group says there's about a fifty-fifty chance he'll be able to pull it off, but my gut feel is higher than that. I'd say seventy-five to eighty percent if he doesn't get torpedoed by a holdout. Then again, I doubt that anyone is smart enough to fool him with a holdout for very long."

"What do you mean 'a holdout?'" Jelks asked curiously.

“As you know, each of the consortium members has supplied money for McKay’s personally directed research and has been assigned specific pieces of research to perform on their own. There are lots of ways to renege on reporting research results, if one of the members thinks they might gain some sort of advantage in doing so.”

Jelks wasn’t going to leave that one lying on the table for even a minute. “So what are our plans for taking advantage of the situation?”

Carlos flashed one of his devious smiles. “We don’t have any at the moment, but I’m hoping to leave this meeting with direction to rectify that situation.”

Jelks returned Carlos’s smile with interest. “Consider yourself so directed, but what have you got in mind?”

“When we got into the consortium, I asked Geoff to do one of his standard background searches on McKay, just in case there was anything we should know. It turns out the guy’s led a life akin to a saint, except that he had a live-in roomy for two years when he was doing his post-graduate work. She was still in undergraduate school when she moved in, and when she graduated she moved back to Aberdeen, her hometown. She got married about two years later to a recent medical school graduate, and now she’s doing the doctor’s wife thing with two kids. Since he wasn’t able to find anything interesting on McKay, Geoff put a tail on Mrs. Martha Isley for a week. Near the end of the surveillance, she made a HighJinx purchase at a curio shop in downtown Aberdeen. A discreet talk with the shop owner informed us that she made a purchase once or twice a month, which would place her in the recreational user category. It’s possible that she and her husband are both recreational users, but he’s a surgeon and probably wouldn’t take the chance. So, if her husband is unaware of her drug use, she might be malleable in an effort to compromise Dr. McKay.”

Jelks turned his gaze to Geoff Brabham but addressed them both. “And you haven’t done anything to follow up on this since you did the surveillance?”

Brabham responded, since he was under the direct glare of Jelks. “I’ve done nothing, sir. Carlos said we would wait and see if we needed to bring any pressure to bear on McKay before we approached Mrs. Isley.”

Jelks swung his attention back to Mattayo. “What about you Carlos?”

“As you keep telling me, boss, timing is everything. I think the time has come for us to have a chat with Mrs. Isley. If she wants to keep her drug use from her husband bad enough, we might be able to get her to renew her relationship with Dr. McKay. We would arrange to get a video of the tryst, of course.”

Jelks leaned back in his chair and shook his head. “Not good enough. So McKay has an affair with an ex-girlfriend that’s now married, so what? He would be embarrassed, but it wouldn’t be enough to get him to subvert the rules of the consortium, which is the desired result of all these machinations, I presume. We need something stronger than that. If we could get him in a hotel room with Mrs. Isley, and even a saint would be susceptible to that just for old times sake, we could slip something into his drink. We could then take Mrs. Isley out of the picture and bring in an obviously underage prostitute. A video of that would definitely do it.”

Carlos was impressed. After two years of daily work with his mentor, he still couldn’t match his boss’s ability to go straight for the juggler. “She might not agree to anything that demeaning of McKay.”

“Hell, I don’t expect her to. Don’t give her any idea of what we’re going to do. Tell her we want him compliant for a few questions about his work, and then we’ll send him on his way, no worse for the wear. She just has to put the drug in his drink and leave. She doesn’t need to know what it is . . . no, better yet, drug them both. Give her a list of questions she’s to work into the conversation with McKay. Tell her it’s just industrial espionage. For some stupid reason, most people don’t think that’s as serious as other breaches of the law. She’ll think keeping her secret is a walk in the park. She’ll jump at the chance.”

Carlos raised his index finger in the air to punctuate the coming statement. “One, she has to want to keep her drug use from her husband, which we don’t know for sure.” His middle finger also went up. “Two, she has to be still held in high enough esteem by McKay for him to be lured to a hotel room.”

Jelks frowned at his assistant. “You don’t start a successful project by finding reasons it’s going to fail. Get out there and make it happen! Hell, I’ve only given you one possible scenario. You and Geoff might come up with something even better. Just make sure you both move it to the top of your priority lists.”

Jelks turned to Wyandotte. “One more thing. I want you to requisition whatever space and personnel you need to start an immediate effort to mirror Dr. McKay’s research. I want to stay with him

step-for-step, and I want to integrate all the results that come in from the other consortium members as well. When we get ready to squeeze McKay, I want to be in a position to take full advantage of it. And don't worry about the budget. Get whatever you need, including the best brains available in jump-gate science and technology—particularly in the technology end. If we can't find a way to leapfrog him in the science, we'll try to get a jump in converting that science to working hardware."

With those instructions to Wyandotte, Brabham, and Mattayo, he turned his attention to Willie Wu. "You agree that the future of the bottom line needs these measures?"

Wu, as stolid as ever, didn't hesitate or mince words. "A minor risk with potentially great rewards."

Jelks swept the participants with a final glare. "Proceed, gentlemen."

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Hal sat at the small breakfast table in the alcove just off the kitchen. His attention was fixed on the wallscreen across from him as the morning news played out its familiar themes. Hal persisted in limiting his news input to the UN sponsored morning news, and he only agreed grudgingly to Harvey's additional inputs in areas that appeared linked to Selene Industries business or areas of Hal's interest known to Harvey.

Getting through the UN broadcast was typically washed down with breakfast, and this morning it was one of his favorites, a cheese and peppers omelet with rye toast and milk. Robbie had done a superb job with his new kitchen programming, even though Harvey claimed the results would be even more favorable when the anthropomorphic prototype took Robbie's place. Supposedly, this would enable better robotic manipulation of kitchen utensils, which Harvey claimed in turn had skewed culinary creativity over the ages. Hal suddenly wondered if Harvey had come up with that idea himself, or if he had read it somewhere.

"Harvey, where did you get the idea that recipes were somehow limited or directed down certain paths by cooking utensils?"

"A query of the database I compiled for Robbie's kitchen programming indicates no reference to that subject. However, it is a logical extension of the relationship for all invention between the available environment and the desired results. In this specific case, I'm quite certain that the insight is not uniquely mine. Would you like for me to search?"

"No, it doesn't really make any difference if someone else has come to that same conclusion or not. The important thing is that you came to the conclusion on your own. Your so called intuitive skills appear to be sharpening."

"As you know, I have given a reasonable amount of effort to understanding such intuitive leaps through an analysis of intuition in human history, the body of research and philosophy on intuition, and the more recent efforts on artificial intelligence. So far, I find that understanding a leap of intuition is about as logical as understanding a leap of faith. I believe Mr. Holmes would note that 'leap' is the operable word."

"Well, I have the same problem, but it doesn't change the fact that they both happen. I do find it interesting though that your intuitive skills appear to be growing. There may be a clue in that fact—somewhere."

"Anyway, there must be something uplifting going on in the world that the UN morning news didn't think worthy of reporting. Linda's only been secluded in her apartment on Skylark for three days, and I'm lonely already. Tell me something to cheer me up."

"Other than business, which we must attend to this morning, I have only two items of interest beyond the United Nations news that I can impart. Unfortunately, neither of them will be classified uplifting by your definition. However, I can categorize them as bad and worse. Which would you like first?"

"So, as my choice between good news and bad news, I get a Hobson's choice. Is that it?"

"Not precisely the definition, but certainly in the spirit of Mr. Hobson's offerings."

"It sounds like no choice to me, Harvey. All right, give me the worse news first."

"Per our discussions on monitoring of the tunable gate consortium members, I have been monitoring internal communications at each of the companies. Most are engaged in some form of subterfuge, which you would probably label 'hard-nosed' business tactics, but Syntech has again stepped over the line. They have significantly increased their tunable gate research effort, in budget, space, and personnel. They appear to be attempting a parallel effort that mirrors the work of Dr. McKay and the other consortium members. That, in itself, appears to be within the consortium's guidelines, since there were no restrictions placed on a member's independent research. However, they also appear to be contemplating some sort of extortion of Dr. McKay, which is clearly in violation of the guidelines and the law."

Hal's initial shock wore off as he contemplated the situation. "Neither one of us should be surprised by this. It's exactly what we suspected. It's why you've been monitoring their internal communications from the startup of the consortium. We discussed the probability that as soon as one of the corporations really figured out the potential of the tunable gate, the stakes would go up dramatically and risk acceptability would go up proportionally. In this case, the law and integrity take a back seat to the potential for bumping up the bottom line."

Hal took a few seconds to think about the situation. Harvey, of course, had long ago figured out when to continue the conversation and when to wait for a prompt from Hal, just by being familiar with Hal's personality. When in doubt, he could read Hal's body language from the multiple cameras available in each room on Adam. "You said they intend to extort Ian. That requires some transgression on Ian's part that is grievous enough for him to be extortable. What secret have they dredged up about Ian that would give them that kind of leverage?"

"Syntech security did a detailed background search on Dr. McKay and found no misdeeds of significance that I could discern. Consequently, I undertook a much more thorough analysis of Dr. McKay's history, and have determined that there is nothing in his past that would rise to the level of permitting extortion."

"You did your usual categorization and probability assessment of each potentially damaging event I presume."

"Of course, how else can one make rational decisions?"

Hal rolled his eyes. "I'm not going to get sucked into a philosophical discussion right now, Harvey. Just put the list on the wallscreen in descending order of ethical or moral correctness."

The wallscreen scrolled a numbered, three column list. Hal ran mentally down the list. "Number fourteen: Female relationship, two years, Glasgow. That's it."

"I disagree with your assessment. The information gathered by Syntech found that it was a normal male – female relationship between a slightly older, male, postgraduate student and an undergraduate female student. When the young lady finished her degree, she returned to her home in Edinburgh, Scotland and Dr. McKay stayed in Glasgow. It appears perfectly normal by all contemporaneous and current standards."

"I'm sure it was, Harvey, but the thirteen items you ranked in front of it were all ethical items. This is the first item on the list to relate in any way to moral rectitude, and I don't see any that follow it either. Believe me, this is it."

"But if it were a normal relationship, acceptable by social standards, how could it be used to extort Dr. McKay?"

"Listen close Harvey, you're suffering from the intellectualization of morals. You want to put them in the same category as ethics—an ethics of sexual conduct. It doesn't work. Frequently, society holds fervent moral principles that make no sense whatsoever. Now if you go back in a society's history and look at when they were first accepted into the social norm, you'll see that they had a real purpose in the context of that specific society. The problem is that society doesn't want to give them up when they no longer serve a purpose, and after thousands of years of accumulation, we slog through life burdened with useless bullshit that gets more attention than ethics. Lecture's over. Go read up on the topic, and we can talk again later."

Hal raised his arm and flipped his wrist in a "brushing-off" motion. "Meanwhile, we need to know how they intend to extort Ian. Go back and take another look at the data. Better yet, I think it's time we put some mini-bots into key locations. Your ethics shouldn't suffer, since we've had a clear indication that Syntech intends to break the law and the code of common decency. Get back to me when you know what they intend to do."

Hal picked up his fork to finish his breakfast, but he put it down again. As it frequently did, dealing with the ethical shortcomings of the people he shared the planet with had turned his stomach.

Pushing back from the table, it occurred to Hal that Harvey had related only the 'worse' news. He had neglected to tell him the 'bad' news. "You're losing it Harvey, you neglected to tell me the 'bad' news."

"Not at all. I am quite incapable of forgetting in the human sense. I had simply determined that you would find it preferable to hear the 'bad' news later rather than sooner. Certainly, a different mood might ameliorate your reaction."

"You make it sound like the 'bad' news is worse than the 'worse' news. Spit it out."

“Very well. Linda told me this morning before you were awake that she had finished grading the term papers, but that she had just been informed by the Particle and Wave Gallery in London that they were going to mount an exhibition of her dynamic-transform light-sculptures.”

“That’s not bad news, that’s great.”

“It is merely a good component of the ‘bad’ news. She said to inform you that she would need several more weeks in seclusion to get ready for the show. I have emphasized weeks in just the manner she related it to me. She did say she would call in a week or two to see how you were doing. She also told me to ‘make myself scarce’ during her seclusion. I assumed she meant that I was to make contact only if there was an emergency.”

“If I were you, I would follow my lead in this situation and define emergencies only as events of greater consequence than the sun going nova.”

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Brittany Sykes stood restlessly in the queue for the Syntech gate at New York municipal. She had checked to make sure her transponder key was notched into her wrist personal where it belonged, so she wouldn’t have the people behind her grumbling as she manually keyed the gate—once this month had been enough.

She shuffled forward one position as the lead person got a green light and walked through the gate. When she stopped, a half-inch diameter mini-bot climbed discreetly over the edge of her shoe sole and onto her shoe. As it did so, the micro-cameras on its underside recorded the image of the shoe below it and sent that image to the micro-screens on the top of the mini-bot. It was virtually invisible and electronically shielded.

At the same time, a rather large fly landed on the back edge of the purse she had slung over her shoulder. Using the same technique as the one on her shoe, it seemed to vanish. Seven other Syntech employees gained similar attachments as they made their way toward the gate.

Finally, she was at the head of the line. The light on the top of the gate flashed green almost as soon as the person in front of her had disappeared, and she walked just as briskly through the gate. As she stepped through, she automatically looked up at the identification camera for her retina check and kept moving. The alarm didn’t go off, so she quickened her pace and turned left toward her office at the first crosswalk in the hallway.

As she came into the department bullpen area, she saw that Susan was already at her desk, guarding the door and mumbling into her wrist personal. When she saw Brittany, she dropped her arm to her desk and gave her usually cheery “good morning.” Brittany glared at her, made a rude comment about morning rush-hour traffic, and closed the door to her private cubical behind her.

Brittany was the manager of Syntech’s technology forecasting group in the Market Research Division and she didn’t like it one bit. She hadn’t wanted the job, even though it was a promotion, but personnel hadn’t given her a choice. It was this job or the street. Syntech had no need for employees that were unwilling to serve the company where the company needed them the most, or something to that effect.

She was an engineer and she wanted a job in engineering or research. She certainly didn’t want to pursue a career as a marketing prostitute. She wanted truth and reality, but here she was, in the la-la land of guesses and fabrications.

While she was mentally booting herself in the ass for staying on at Syntech and trying to get ready for another day beating her head against the technical ramifications of tunable gate technology, her riders departed. One of them flew silently to the wall and ceiling corner behind her on her left. The other flew out the door, making color and image changes to match her visual perspective as it rounded the doorjamb and continued into the bullpen.

The scene repeated itself in various Syntech offices throughout the building seven more times in the next ten minutes. Data streamed through micro-gate connections and into Harvey’s buffers, where it was screened for relevance, analyzed for content, and categorized for further review.

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The wallscreen in the breakfast nook dissolved from the UN morning news program to the image of Harvey’s “serious discussion” persona. Hal groaned.

“Good morning, Hal. I have discovered Syntech’s plan to extort Dr. McKay, and you were correct in your conclusion that it involves his former sexual partner.”

Hal finished swallowing his buckwheat cakes smothered in maple syrup and followed the mouthful with a quarter glass of buttermilk. A satisfied smile turned up the corners of his mouth. "Please, Harvey, could you find a better phrase than 'former sexual partner.' You make it sound like a business arrangement, which knowing Ian, I'm sure it wasn't. How about former love?"

"If you feel more comfortable with that phrase, then, of course, I will use it, but it assumes a conclusion that I have been unable to verify from the information available. Notwithstanding the proper phrase to express Dr. McKay's relationship with the former Martha Barnes, Syntech plans to use her to lure him to a hotel room where they will drug them both and make recordings of sexual activities between Dr. McKay and an underage prostitute."

"Whoa! You're going too fast. The former Martha Barnes? She's dead? I somehow doubt Ian suffers from necrophilia."

"That was her maiden name, Barnes. She is now Mrs. Martha Isley, wife of Jordan Isley, a surgeon in Edinburgh, Scotland."

"And just why would Mrs. Isley be willing to participate in this obviously illegal scheme that's damaging to her former love?"

"Syntech's surveillance of Mrs. Isley revealed that she is an occasional user of HighJinx, and they have threatened to reveal this fact to her husband if she doesn't cooperate."

Hal rolled that over in his mind and still couldn't understand her willingness to participate. "I know HighJinx is illegal in most countries, but it isn't a narcotic and any dependency is psychological and treatable. It just doesn't seem like enough to make a person do something like this."

"There are several additional reasons for her participation that should explain this to you better than I have obviously done so far. First, Syntech's surveillance and inquiry indicated that Mrs. Isley is not dependent but a recreational user. Second, it appears that Dr. Isley is deeply committed to the Anglican Church of God. Third, Mrs. Isley has been led to believe that she is only going to get Dr. McKay engaged in conversation about his research and is therefore only participating in industrial espionage. And fourth, they have agreed to pay her fifty-thousand Euros for her time, which will allow her to pursue her indulgence and continue to hide the fact from her husband indefinitely."

"Good old industrial espionage, the crime that isn't a crime, merely the big boys going at each other the way businesses do. So, she's been duped and has no idea of what they really intend for Ian."

"Yes, she has been misled, but it is difficult to find her free of guilt, nevertheless. I find people's attitude about industrial espionage rather puzzling. Its employment can have grave societal effects if unchecked, and yet people seem to relegate it to a relatively low status on their ethical infraction hierarchy."

"Well put, Harvey, but that's a philosophical discussion for another day. The question for today is: what are we going to do about this?"

"I have a plan for your consideration that I believe would quite neatly turn the tables on Syntech."

"By all means, Harvey, go on."

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Martha Isley was so nervous her chin was shaking. She toyed again with taking just one HighJinx, but she knew the reaction wasn't really right for what she had to do. She had gated into London's Mayfair Station just a few minutes ago, and having been to the St. George on several occasions with Jordan, she knew how to get to the hotel's private jump-gate in the commercial section of the station. She had rolled her baggage along behind her and through the hotel's gate in a matter of minutes.

Standing at the reception desk, she mumbled her way through the pleasantries of registration, confirming that she was who her wrist personal indicated she was and signing her name on the electronic pad. She slipped the transponder key out of her wrist personal and watched while the desk clerk added a room code. She slipped the key back into her personal, smiled at the clerk, and headed to the elevator wheeling her bag behind her.

She glanced at the time entry in the lower left-hand side of the wallscreen as she entered the room, noting she had at least three hours before it was likely she would get a call from the Syntech security man she had spoken with yesterday. She decided a nap might calm her, if she could sleep, so she instructed her personal, "wake me in an hour," and stretched out across the bed.

Sleep was a while arriving, but she knew she must have slept for at least thirty minutes, and her nervousness seemed to have settled a bit. She took a shower, took an extravagant amount of time and

care with her hair and makeup, and put on the simply cut but sexy dress she had brought for the occasion. She still had about forty minutes minimum to wait.

The plan was for her to accidentally encounter Ian during tea following the afternoon session of the symposium he was participating in here at the hotel. The Syntech security man was to call her in her room when Ian went into the tearoom.

The tearoom meeting had been her suggestion. She knew that when away from his work, the sky would have to fall before Ian would miss afternoon tea. It was one of those little things about Ian that had made him simultaneously infuriating and charming, but in the years since college, she too had succumbed to the afternoon tea habit. Did that mean she would see only the charm now?

She fidgeted until her room com finally chimed. There was no image, just voice. "Mrs. Isley?"

"Yes."

"The subject has entered the tearoom." The connection closed with an audible click, and Martha got up out of the chair she was sitting in and went to the mirror for a final check. She straightened her dress, patted her hair a bit, and picked up the matching wrap for the dress that was hanging on the back of the other chair. With a sigh, she keyed the touch panel on the door and walked into the corridor.

The tearoom at the St. George is rather large, since it doubled in the evenings as the informal dining room, but she spotted Ian sitting alone as usual at a small table as far from the door and other distractions as possible. He was paying absolutely no attention to the door, and didn't see her come in. In fact, he didn't even look up when she was standing at the table until she spoke to him. "Ian, do you mind if I sit with you?"

Ian swam up from his N-space reverie and focused on the person standing just to his left at the table. As the face before him registered in his brain, he jumped up out of his chair, almost knocking it over in his haste, and smiled warmly. "Martha, what a surprise. How are you? What are you doing here at the St. George? How's Jordan . . . and the kids. God, Martha, it's been a while."

"Nine years since you came to my wedding, but I've tried to keep you up to date with email clips and pics on the holidays. You certainly know more about my life in the ten years since college than I know about yours. Of course, if I wanted to read the scientific journals, I guess I'd know more about what you've been doing."

Ian caught himself staring. Martha looked simply wonderful. He wondered if she had really become this much more attractive or if his taste had changed to favor the mature female form. "Sit, Martha. Please. We need to catch up. You look great. Would you like some tea?"

"Yes, I would. It's why I came in here. I didn't think I'd be seeing you. I've been out shopping all day, and that always wears me out. Tea would be nice, and a scone with jam would go well, too."

Ian twisted around in his seat to find the waiter, who was close at hand, having observed the arrival of another party at the table. Ian ordered another pot of Darjeeling and a plate of scones and jam. Dispensing with the waiter, he returned to conversation with Martha and the time flew by.

Martha found herself relaxing in Ian's company and genuinely enjoying herself. For a while, she completely forgot about her mission and its tawdriness. They chatted about old times, old friends, and fond memories of being together. Neither of them wanted to get up from the table and walk away, but the time had flown, and the wait-staff was looking impatiently at the only table remaining occupied from tea.

They adjourned to the sitting room off the lobby, overlooking Smythson Park, and continued talking. When Martha excused herself to use the facilities, she was brought down to earth by the chime of her wrist personal. She didn't have an earplug or a lapel mike, so she brought her wrist up to her face where the conversation could be private with the automatic suppression employed by the personal when it was brought to close proximity. "Yes?"

"Mrs. Isley? May I remind you of the purpose of your meeting with Dr. McKay?"

Martha was irritated, but she wasn't sure it was because of the disruption, the reality check, or simply second thoughts about what she was doing. "I know why I'm here. You don't need to remind me. We just haven't gotten around to talking about his work yet. My best chance of getting him to my room is after dinner, as originally planned. We didn't expect him to talk about his work in public. Now leave me alone."

She brought her wrist down from her mouth and finished touching up her makeup. It wasn't easy. She was shaking again. She was definitely having second thoughts, but she knew she was boxed in. She'd give anything to have the last couple of years to live over again. She'd find some other way to deal with the boredom than HighJinx—that was for sure. How could she make such a mess of things?

Well, it was too late now. All she could do was protect Ian as much as possible in all this, but how was she going to do that? She knew that work was everything to Ian. She hoped that whatever he revealed to her was enough to get Syntech off her back and not so much as to be really damaging to Ian. She'd find some way to make it up to him. She would!

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Ian had inevitably invited her to dinner and she accepted with mixed emotions. She wanted something to come up that would make it impossible to go through with the industrial espionage for Syntech, but she didn't want the reunion with Ian to end, either. They had talked and laughed their way through dinner, just like tea. And again, they found themselves being stared down by the wait-staff.

When Martha suggested they have a nightcap in her room where they could relax for a little longer before having to give up their reunion, Ian was a little reluctant, but she convinced him he was being prudish and that she didn't have intentions of adultery. He had smiled, saying she knew him too well. The fact was that she knew him better than anyone else. He had never had another relationship that was as open and honest as the one he had with Martha. They were both young enough to have taken it for what it was, without the cluttering-up that adults seemed to want to do with relationships.

She got Ian to sit in one of her room's sitting area chairs, got him a single-malt from the autobar, and got herself a ruby port. She was stretching her calorie intake for the day, but she was stretching everything else too, so why not.

She sat down in the chair opposite Ian and sipped her port, trying to remember the questions she had been given to memorize by Syntech. "I know I've talked your ears off about the children and the mundane existence of a doctor's wife. Don't forget I do have a degree in elemental physics, even if I haven't kept up with all the new stuff. What are you working on now, Ian?"

Ian seemed to jump at the chance to talk about his work. He launched into an explanation of his work on a tunable gate, keeping the physics at a level he knew she could understand and explaining in detail where she was over her head but clearly wanted to understand.

Martha listened with what surprised her as genuine interest. She hadn't tried to grasp a difficult physics concept since her Cambridge days. She tried to weave in the questions that Syntech had provided in a manner that seemed natural to the flow of Ian's animated outpouring.

In his emotionally hyper state, a combination of being in Martha's presence and talking about the possibility of a tunable gate, Ian was sipping a bit fast on the single-malt whiskey. If the drink had contained only single-malt, Ian would have been just maintaining the alcohol level in his blood established by the dinner wine; however, the drug laced drink that had come out of the Syntech modified autobar suddenly kicked in, and Ian's stream of talk lost its volume and its verve. He blinked silently a few times, the last time without really opening his eyes, and his chin sank down towards his chest.

Martha put her own glass down on the table beside her. "Ian, are you all right?"

There was no response from Ian, and Martha rose quickly to go over to him. She almost fell as she stood up, and she quickly sank back into the chair, her head beginning to spin around. She too lost consciousness, her head lolling back onto the wing of the chair.

In less than a minute, the room door opened and a pair of size-mismatched Syntech agents came in from the corridor, closing the door quickly behind them. The bigger one seemed to be in charge. "Give her the hypo-spray and get her into the other room. Bring the chippy over as soon as you dump this one."

The smaller one walked over to the chair where Martha was slumped and applied a hypo-spray taken from his pocket to her neck. There was a barely audible hiss as the counteractive agent was diffused into her bloodstream. In about twenty seconds, Martha began to start mumbling, and she opened a glazed pair of eyes.

She made no effort to resist when the shorter man pulled her to her feet. She staggered a bit as if roused from a drunken stupor, but succeeded in stumbling to the door with help. The door closed behind them.

The big man also took a hypo-spray from his pocket and applied it to Ian's neck. There was a different cocktail in the spray for Ian, and while his eyes had the same glazed look when his eyes opened, he seemed to be more in control of his body's motor functions. But like Martha, he seemed totally compliant to the instructions being issued.

Ian was led into the bedroom and told to remove his clothes. A quizzical look crossed his face, but he started systematically removing his clothes as instructed, draping them neatly over the back of the bedroom chair. He had just finished taking off his socks when shorty came in with a strikingly well

constructed but obviously teenage girl in tow. She looked about thirteen or fourteen but could have been a couple of years older at the most.

She had poorly dyed hair, neatly but heavily applied makeup, a knit shirt that looked more like a body tattoo, and a shiny covering from the waist down that looked like it had been dipped into rather than pulled on. She looked at the big guy. "This is him?"

Not waiting for an answer, she turned to Ian and gave him a top to bottom glance. "Not bad. How'd ya want it, dearie?"

The glazed look on Ian's face never changed. The big guy gave her a leer. "I'm sure he'll like whatever you decide. Just get him in the bed in several different compromising positions—be creative. The cameras in here will take some pics, you'll get paid, and then you'll forget it ever happened. Easy money."

She stood there nonplussed for a moment, and then, remarkably, she was able to peel out of both the pants and the shirt. There was nothing else to take off. Lying down on the bed, she looked up at Ian, still standing there looking off into space. "Jeeze, he looks like a zombie. I'm not sure he's gonna be able to do anything worth the pixels."

"That's not your worry, chippy. Just get him in the right position. There's enough cameras in here to get an angle that'll look just fine."

As Ian was climbing into the bed as instructed by the big guy, a voice intruded from the doorway. "Stay just where you are gentlemen, and you too lady. I wouldn't want to get nervous with this thing."

Both shorty and big guy spun around from the scene on the bed. Shorty was reaching inside his jacket. "Uh Uh. I wouldn't try that if I were you. Have you ever seen the hole one of these cannons makes?"

Shorty's hand stopped just before disappearing under his jacket and slowly came back to his side. The big guy just squeezed his hands into fists. Neither of them seemed eager to tangle with the serious looking guy in the doorway. He looked to be over two meters and bulky. His shaved head gave him a sinister look, and overall, he was remarkably similar to a turn of the century action-adventure star.

The intruder backed up enough to clear the doorway. "Okay, you guys come on out of there real quietly. You too, sweetheart. And get those clothes back on."

The chippy popped up, obviously scared, grabbed her clothes off the foot of the big bed, and started the contortions that would again have her fully clad as she scooted out of the bedroom and into the sitting room. While she was still writhing and wriggling, the intruder issued new instructions. "This is how it's going to work. I'm going to follow the three of you to the doorway and watch you go down the hall and get in the lift. You will not go back to your room across the hall and you will not stop walking until you are out of this hotel. If I see any of you again, you're wasted. Got it?"

Shorty's expression never changed from the neutral he had assumed in the bedroom. Big guy's glare likewise stayed in place. The chippy was shaking visibly. Shorty walked to the door and hit the control panel, and as the door slid silently open, they walked through and started down the hallway to the lift. The big guy glanced around and saw the intruder standing just inside the doorway, watching. The lift door opened as soon as they touched the control panel and they disappeared inside.

The intruder withdrew into the room, the door slid shut behind him, and he blinked out of existence. In the bedroom, a mini-bot settled on a blankly staring Ian's neck and hissed. In the room across the hall, a mini-bot settled on the neck of a comatose Martha Isley and hissed.

Ian blinked a few times trying to get the ceiling of the room to come properly into focus. As he slowly succeeded, he noted the message on the wallscreen opposite the bed he was lying in. "You have been drugged in an extortion attempt by one of the tunable gate consortium members. The extortion scheme was discovered by World Federation Security and deterred. Please dress immediately and return to your own room. You are cautioned to avoid compromising situations in the future. Discreet surveillance will be maintained on your future activities for the remaining period of the tunable gate project."

As Martha struggled to swing her legs over the edge of the bed and stand up, her eye caught the wallscreen display. "You have been duped and drugged by Syntech. While you were told that you would only be engaged in industrial espionage for Syntech, the real purpose was to permit the extortion of Dr. McKay by taking images of him engaged with an underage prostitute. The extortion scheme was discovered and prevented by World Federation Security. Dr. McKay is currently dressing and will shortly leave your room. Please return to your room in thirty minutes, collect your belongings, and check out of the

hotel. If these instructions are followed, no legal action will be taken against you by the UN for your involvement.”

Martha sat back on the bed, stunned. How could she have been so stupid? How could she have taken such a risk with Ian's life just to protect her vanity or even her marriage, if it came to that? What will Ian think? My God, what was she going to do? She couldn't just walk away from all this and ignore it. She had to think this through. She lay back on the bed and closed her eyes, but the tears started leaking from their corners. She sobbed for a long time—more than the required thirty minutes.

Ian continued to lie there while his sluggish brain tried to get a handle on all that had transpired. Something had obviously happened, since he was naked in a bed with no recollection of how he got there. What had they done to him? The message on the wallscreen didn't say. But he couldn't believe that Martha would be a part of an extortion scheme . . . unless she were really in a desperate situation. Was Martha in trouble? Where was she?

His eyes flashed back to the wallscreen message, and he swung shakily out of bed. He dressed quickly and left the room, but his mind was in turmoil as he worried over Martha's involvement in all of this. When he entered his own room, the turmoil hadn't settled in the least, and he sat in one of the sitting room chairs, propping his elbows on his knees with his chin in his hands. He needed to think.

In what seemed like a few minutes but was really more than an hour, Ian could cogitate no longer. He needed to take action. He walked to the room's com unit, pushed the call button, and waited for the desk computer. “Mrs. Martha Isley.”

“One moment, please.”

Ian waited while the unit in Martha's room was obviously chiming. In about forty-five seconds, the computer responded again, “I'm sorry, sir. Mrs. Isley is not available.”

Ian stabbed the disconnect and started back to his chair. He was diverted by a light rap on his door. He looked through the security peep and saw Martha standing outside his door. He hit the control panel and the door slid open to a trembling and distressed Martha. “Ian, I'm so sorry.”

Ian extended his arms, and she rushed in.

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Hal watched as the wallscreen flicked off and Harvey's serious persona stirred in the chair angled across from him. “A masterpiece, Harvey. Send it just the way it is. The surveillance from the room being used by the Syntech security guys makes it absolutely clear who the perpetrators were, and the scenes from Mrs. Isley's bedroom make it clear what their intentions were for the blackmail.”

“You are satisfied then with my editing from the many hours of multiple angles available?”

“Absolutely. There's no need to look at them all to know that this will have just the desired effect on Syntech. It doesn't mean they will cease and desist, though. You need to watch them like a hawk. With this scheme squashed, they'll be trying even harder with whatever other dirty tricks they can conjure up.”

“I will continue to monitor all their activities and communications, but there is nothing illegal about their effort to mirror the research being conducted by Dr. McKay. They have hired an impressive cadre of jump-gate scientists, and might well succeed in achieving a tunable gate before he does. What is our strategy if that occurs?”

Hal pursed his lips and looked at the ceiling momentarily. “None. There's nothing illegal or even morally wrong with competition. We did, however, secure a legally binding agreement from all the consortium members that requires information sharing and leaves world patent rights for all tunable gate science and technology in the hands of the UN, and that extends to first derivative patents as well. I think we're as covered as we can be. If Syntech gets there first and doesn't share the information with the consortium within twenty-four hours, we then have a legal case, but that won't keep them from doing it if they can. In fact, we can rest assured they will do whatever is to their own advantage, legal implications or not.”

The Harvey holo nodded sagely. “I agree with your assessment, Hal. I have doubled the number of mini-bots distributed in their various operations, since my initial infiltration, and can add more if it becomes necessary.”

Hal still hadn't figured out who the serious persona was based upon, but he liked Harvey's effort, if not his stubborn refusal to reveal his basis. He found himself increasingly thinking of this persona as “Dr. Serious.” Maybe that was good enough. “By the way, the holographic projection you used for the bust was great, but you've got me on this one too. I can vaguely remember having seen the face before, but I can't come up with a name.”

"I am very pleased to have surprised you again. I have just moved one of his better movies from 1993 to the top of your recreational viewing list. I am certain you will put the name and face together after seeing the movie."

"You'll blank it in the credits though?"

"Of course."

"Oh, congratulations on the technology that allows you to cram such a vivid and accurate holo projection into the mini-bots, but I do have one question about the hero hologram. What would you have done if either of them had pulled a gun or tried to jump you? Holograms aren't too physical."

"I was quite prepared to tranquilize them if they showed any sign of active resistance. There was a mini-bot hovering in the gun image carrying six tranquilizing flechettes."

"A hero with a six-gun, huh?"

Dr. Serious seemed to look right into Hal's eyes, his facial expression stolid. "No pun intended, I assure you. Simply a case of serendipitous capacity."

Ian struggled through the last of the debugging report with an audible sigh. It was late, and he was tired of the concentration required for the debugging. His AI had failed to find anything wrong with the frequency-tuning program, but that was because there was nothing strictly wrong with it. It was just woefully inefficient. He hoped that the changes he had finally finished would allow fast enough switching to allow a frequency lock-on without just whizzing on by. He just couldn't seem to get the sensitivity out of his circuits that he needed to achieve a stable lock-on.

He pitched his voice loud enough for Brian Watkins, who was across the room plugging chips into a new circuit board, to hear him. The rest of the research staff was long gone. "Brian, go back to the B-gate monitor. I'm ready to run the frequency-tuning program again. If this doesn't work, I'm afraid we're back to trying to boost chip speed, and that'll take new chip research rather than anything we can do. Let me know when you're ready."

Brian moved from the assembly bench to the console across the room and slipped into the chair. "Ready."

Ian keyed the program to start and slumped back in his chair. He reached for his tea, which was cold, but being tea, was always drinkable. He had one swallow, and before he could set the cup down again, the program execution was complete. There was no lock, and if anyone had been watching, they would have seen him slump even further into his chair.

"No lock here, Brian. Check the data stream to see if you got the usual micro-transient spike."

Ian could hear the click of Brian's keyboard as he brought up the data stream recorded during the test run. There was a moment's silence before he got a response from Brian. "There it is, Dr. McKay, but we did get a broader spike. Let me check it against the last test."

There were more clicks on Brian's keyboard and then another response. "Yes! Doctor., it's definitely broader. Increasing the efficiency is what we needed."

Ian's reply was less enthusiastic. "Don't get carried away. We've known the circuit would work for some time now, if we could make it stronger or increase its efficiency. There's nothing wrong with the science, but we're still falling short on the technology. We're going to have to go back to Matsonumi or Syntech and urge them to speed up their programs for broader bands on their high-speed optical chips. We need more speed and more muscle. I think we've wrung everything possible out of the circuit designs themselves short of starting over, and I don't think the consortium will fund a complete reset almost a year into the project. Let's call it a night."

"Okay, sir. We'll get it tomorrow. You'll see."

"System off," Ian intoned. He pulled the Wanderer from his head and placed it on the side of the desk, leaned his weight onto the front of the desk, and pushed himself and stiff knees into a vertical position. Putting his hands on his hips, he pushed his hips forward and arched his back for a few seconds. He had been in the desk chair, comfortable as it might be, for far too long.

He got to the security door just before Brian and braced himself to apply the usual effort required to swing the thing open against its spring-loaded closure mechanism. He almost fell over backwards into Brian when the door opened almost normally. "Whoa! I forgot you got the maintenance guy to look at the door today. What a difference!"

Brian smiled. "Yes sir. He asked why we hadn't said something before now. He said the closure spring was set much too high and he would set it as low as security allowed. I guess he did."

Standing there with the doorknob in his hand, Ian saw a possible solution to his tuning problem. All he needed was something to jog his brain in the right direction, and the door spring tension had done it. "There's a possible answer, Brian."

"An answer to what, Dr. McKay?"

The frustration of the day brought a tone of pique to Ian's reply. "The tuning lock problem, Brian. What else?"

Brian recoiled a bit with a weak, "Oh."

"Don't you see, the force required to open the door was much less than it used to be. I almost fell because it swung back so quickly."

"Uh, yes, I saw that, Dr. McKay. But what does that have to do with the tuning lock?"

"We need more power or more speed, right? So there's another element of the equation we can try, and we haven't even thought of it before. We change the requirements for power and the speed might increase with the circuits we've got. It's worth a try, anyway."

Brian was perplexed. "I still don't follow you, sir."

"The Trojan point anomaly. We take the experiment to a Trojan point. The power needed to push through a gate connection is less than here in the laboratory. There, the power we've got might be enough to get the circuit lock-up speed we need. I'm going to try this on Dr. Dowd tomorrow. See what he thinks. If he thinks it might work, I'll take it to Neilson."

The door clanged shut behind them, and they went out into the early morning dampness.

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Hal sat across the desk from Ian McKay in the little temporary office the UN made available to Hal on consortium meeting days. They were finalizing strategies and making sure Hal understood the technical details sufficient to the level that might be discussed by the consortium members in the meeting, which wasn't likely to be in much depth. The consortium was more worried about dollars and markets than science and technology.

Glancing at his personal, Hal rose up out of his chair. "I think that's got it, Ian. Thanks for making sure I don't sound like an idiot in there." Then with a smile, "And somehow I've managed to run us right up to meeting time, obviating any necessity for chit chat with the members."

Ian was well aware that Hal had little liking for the consortium representatives that attended their meetings, and indeed, he was significantly different from them in approach and manner. Hal almost made the meetings tolerable by keeping them focused and brief, but Ian found Hal to be too self-effacing in his understanding of jump-gate physics. He thought Hal's level of understanding well beyond that of the layman and certainly beyond that of any of the other consortium representatives.

Hal and Ian entered the meeting room together to the usual murmur of greetings. Ian took his seat on Hal's left, while Hal took his seat at the head of the horseshoe-shaped table. He started on a formal note. "Good morning ladies and gentlemen. As you know, this is a special meeting of the consortium members to consider the research strategy change proposed by Dr. McKay. You were all provided with copies of his report and request last week, so there was plenty of time for your technical people to review his recommendations. I have already received agreement by all members to the official minutes of the last meeting, so we will proceed immediately to the matter at hand. Dr. McKay will take any questions you might have. Dr. McKay."

Half a dozen fingers went up around the table and Hal recognized the first one on his left, the representative from Gumphata Industries. It pleased Hal that she was the first to ask a question, since Ms. Gumphata was clearly the most intelligent member of the group, and she was likely to get the ball rolling in the right direction. Her mellifluous voice and slight but charming accent never failed to fix the attention of the group, and it didn't hurt any that she was a star quality beauty that had been born into the family dynasty that controlled Gumphata Industries.

She leaned toward Ian as if to give intensity to her words, causing her shoulder-length, glossy-black hair to pitch slightly forward, framing her dark olive face and accenting her already striking facial features. "Dr. McKay, does your request to change the venue of your research mean that we have wasted the time and money we have already spent on this project?"

Ian was prepared for this one and was glad it was the first question. "Not at all, Ms. Gumphata. Research efforts are typically multi-directional and iterative. When we were setting up the budget, if you

remember, we earmarked half of the project budget for ‘unspecified scientific inquiries’ precisely because of the unpredictable direction that partial results might steer subsequent inquiry.”

Ms. Gumphata smiled slightly, acknowledging the previous consortium agreement with the project’s budgetary structure. “But, Dr. McKay, you are now asking us to bet the entire remaining budget on a new and single line of inquiry. What happens if this direction also proves to be a dead end?”

This was a much more difficult question, but Ian had known someone would ask it. “That is absolutely true. It is my judgement that this project has but one direction to follow at this juncture. It is limited to this direction by the Coleman Principle that efficiency in research is inversely proportional to the number of variables being explored, to which I subscribe wholeheartedly. As I explained in our initial meetings, the entire project was limited to exploring the feasibility of using the heterodyning circuits I had designed to substitute for the virtually absolute frequency lock provided by twinned crystals. In doing this research, the components of the circuits were to be off-the-shelf electronics that employed already well understood principles of physics. The failure of our research to date could possibly be mitigated or reversed by the next generation of solid-state electronics, particularly coherent light processors in the ultra-violet frequency. But those developments are five to ten years down the road and subject to their own vagaries of research and development. We could, of course, wait for these developments to see if they would solve our problems, but if *this* project is to succeed, the only possibility I see is to use the gravity interaction effect to compensate for our current lack of both power and speed in the circuit designs.”

Ian gave a slightly flustered smile. “I hope I haven’t been too technical with my reply.”

“Not at all, Doctor, and I assume you were modestly referring to what is now called the McKay Effect.” This brought a flush to Ian’s face and a look of embarrassed modesty, while Ms. Gumphata continued. “If I interpret correctly, you are saying that this is the only chance we have of making the circuits work in the near future, and we might as well take it, since it is within the original budget. If the effort fails, we can revisit the concept in three to five years if we choose. Am I correct?”

“Perfectly.”

Ms. Gumphata leaned back into her swivel chair obviously satisfied with the answer, and Hal motioned to the next raised finger around the table. It was the Syntech representative, Carlos Mattayo. “Mr. Mattayo?”

With a slightly smug smile and his usual large dose of arrogance, Carlos Mattayo addressed the room rather than Ian. “How do we know that the money we’ve already spent on this project, both the efforts at your laboratory and the individual efforts of the consortium members you’ve been directing, was money well spent? Are we just throwing good money after bad, kidding ourselves that a tunable gate is even possible? How do you manage truly creative research anyway?” The smug smile broadened as he swept the room one more time with his eyes as if to emphasize the wisdom of his words.

Ian was pissed, and he could sense that Hal was about to jump in. He leashed his anger and tried his best to respond coolly and professionally. He too addressed his remarks to the seated representatives. “Mr. Mattayo has raised some serious questions, all of which need to be addressed, and I will do so but not necessarily in the order he raised them. It seems a bit late to question the advisability of entering into this consortium to research tunable gates, but it is valid to question the sagacity of continuing to spend money on what could be a fruitless endeavor. All I can say is that we knew the risks inherent in the research effort, and we planned our budget accordingly. We have now arrived at a trigger point for commitment of the remaining budget that requires the same kind of commitment decision that was made in the initial stages of the project.

“As to the management of creative research, I mentioned previously the Coleman Principle established by Professor Coleman of the Harvard School of Creative Science. When we started this project, I initiated a symposium of all the assigned researchers from the consortium companies to determine the manner in which we would manage the research effort. There was a virtually unanimous decision that the project would be best served by instituting Professor Coleman’s theory of Containment Management as the basis for managing the project.”

Ian stabbed the console key in front of him that activated the wallscreen on the far wall. He then activated his own touch screen and the resident AI and pulled the drawing stylus from its recess. “Containment Management is a rather simple theory that is by definition infinitely flexible in its exact implementation. Consequently, it requires constant attention to detail and a good deal of skill. You will have to be the judge of whether or not I have adequately applied such skill, but the process is easy to understand.”

Ian had already prepared the AI for possible presentation of illustrative graphics at the meeting. “Computer, system on. Draw a maximum screen-sized circle, unfilled.” The screen changed to show a large, empty circle.

“Computer, place a large, red dot in the center of the circle.” The dot dutifully appeared. “A little larger.” The dot’s diameter grew half again larger. “That’s good.” He glanced quickly around the table. “Now, the dot in the center of the circle represents the solution to the research problem. The circle itself represents the boundary of reasonable, possible solutions, that is, all the solutions that are reasonably possible within the original definition of the basic research objectives and limitations are assumed to be contained within the circle. However, the solutions exact position within the circle is never known or it would be easy to direct your research towards it. Computer, locate the red dot randomly within the circle.” The dot moved about a third of the distance from the center to the upper right of the boundary circle of possible solutions.

“Professor Coleman observed over the course of his career in the field of scientific research that the truly creative researchers tended to have several similar characteristics. They all come to a research project with an intuitive approach to the solution already formulated in their minds, or they formulate one quickly after a review of all the available information. Once they have formulated their intuitive approach to the solution, they are single-tracked in their pursuit of the solution by working through all the variables of their approach. While on their quest, they are virtually unsteerable while they examine each and every possibility inherent in their approach. And finally, the energy they expended in their quest for the solution is directly proportional to the possibilities left to be examined in their intuitive approach.

“Computer, add six black dots about a quarter the size of the central dot at random inside the circle.” The dots popped up on the screen as directed. “These dots will represent individual researchers for our purposes here.

“Computer, from each dot, draw a straight line having the same width as the dot’s diameter, in a random direction, to its intersection with the bounding circle.” Ian looked at the screen and smiled. “Good. It’s always nice when chance helps you out. In this case, the randomly generated lines failed to strike the solution.

“The lines represent the one-tracked quest of the researcher for the solution. He is convinced that his intuitive approach has the best possible chance of success, and he busily works his way through all the possibilities for solution that his approach offers. However, he starts with a large number of possible solutions in his approach, but as he works his way through these possibilities without success, the number of remaining solutions naturally diminishes. With this diminution, there is a concomitant reduction in his enthusiasm for his approach and a flagging of his creative effort.

“Computer, narrow the width of the line from its start at the dot to half the width at its juncture with the bounding circle.” Ian continued as the screen changed to show the shrinking lines flowing out from the ‘researcher’ dots. “The attenuation of these lines represent the shrinking possibility that they will intersect with the solution and shrinking creative effort being applied by the researcher. And don’t forget that there might be more than one or even many possible solutions to the research problem.

“It’s easy to see that the research manager must be vigilant to keep his researchers within the boundary of ‘reasonable solutions’, that is within the bounding circle—even though we all know that there is always the very small chance of that lightning strike of serendipity. But that is a very inefficient use of resources, and at this point, Professor Coleman borrowed the well-known economic concept of diminishing returns. As every intuitive approach is different and every researcher is different, the rate at which the researcher will reach diminishing returns in his efforts will vary. The research manager’s job is to monitor the efforts of each researcher so that the point of diminishing returns can be ascertained. At that point, the manager must stop the researcher’s line of inquiry and redirect his efforts. That redirection starts by isolating the researcher, providing him or her with the results of all the other researchers to date, and requiring him or her to make a systematic review of those results. I should note here that those results are primarily negative, since they are things that didn’t work.”

With the stylus, Ian touched the console screen in front of him. “Let’s say that the research manager determines that this researcher has reached diminishing returns on his intuitive approach at this point, and he is stopped in his efforts by the manager. Three positive results have been achieved: the attenuation of his or her creative effort has been stopped, with the possibility of regenerating his or her enthusiasm; the size of the containment circle has been reduced by the elimination of solutions originally believed to be possible; and the time and resources required to exhaust the examination of all the

approach's possibilities have been saved. Now, it is possible that the approach was a correct one and it will be cut off before it has a chance to come to fruition, but the odds weigh heavily against that.

"Computer, shrink the diameter of the bounding circle, which I will refer to in the future as the containing circle, to reflect the enclosed area being reduced by one percent." The containing circle shrank visibly on the wallscreen. "This shrinkage represents the new volume of possible solutions.

"Computer, at the point where I touched the line with the stylus, terminate the existing line in its flow to the containing circle and redirect it randomly within the containment circle, starting the redirection with the original line width and showing the original attenuation." Ian looked up at the wallscreen. "Good, I see we missed the solution again.

"Computer, generate randomly directed lines from the remaining researcher dots to the containing circle, using the same rate of attenuation as the first line and disregarding possible random directions that would cause the lines to intersect the central dot." The wallscreen image now showed all the researcher dots with lines extending in various directions to the containing circle, except for the first line with its crook.

"Computer, show a termination for each new line at the same level of attenuation that I indicated for the first line, if that attenuation occurs before the line reaches the containment circle. If the attenuation level I indicated does not occur before the line reaches the containment circle, terminate the line at the containment circle." Ian took a quick look around the table to see if he had lost anyone, but found them surprisingly focussed on the wallscreen image.

"For purposes of speeding up my illustration, I will show the shrinking size of the containment circle as a simple step function of one percent, but in reality it would vary with each researchers efforts and abilities. Computer, assigning a random order of termination sequence to the new five lines, shrink the containing circle one percent with each termination at two second intervals." Ian watched as the computer walked through the two-second steps of shrinkage.

Seeing that one of the lines now penetrated the containing circle, he issued additional instructions to the computer. "Computer, terminate any lines that have penetrated the containing circle. Now, add truly random lines from the points of termination similar to the first line termination." There were now six crooked lines flowing from the researcher dots on the wallscreen, none of which intersected the solution dot at the center.

"Computer, step through continuing iterations of lines, terminations, and containing circle shrinkages at one second intervals until a line intersects the central solution dot, and show a step count in the lower right of the screen." Ian watched as the wallscreen showed a steadily shrinking containment circle and a growing maze of crooked lines, until one of the lines intersected the solution dot and the screen froze.

Ian surveyed the table and saw that he had all their eyes back on him. "Now that step through was done with each researcher's new direction being as random as his first effort. Professor Coleman theorized that a good research manager would be able to focus a redirected researcher's effort back toward the main body of probable solution within a containment angle of only plus or minus thirty degrees, or a total of sixty degrees. The first step through took seventy-three iterations. Let's see what result we would get with a first rate research manager.

"Computer, go back to the beginning and step through again at one second intervals but using the plus or minus thirty degree focus of random redirection." This time the intersection with the solution took only fourteen steps.

As the eyes of the consortium members left the screen and swung back to Ian, he finished up his tutorial. "I apologize for the lecture, but I thought it essential that you understand that your money is being as efficiently applied to the problem as possible on a research project of this nature. While I have surely fallen short of professor Coleman's theoretical sixty degree limit of refocus, I am comfortable that our research efforts have been reasonably efficient, and I have endeavored to convey that in each and every research report I have issued. I again urge you to continue the project and to allow the changes I have proposed in the project's strategy. Are there any questions?"

Ian brought his gaze deliberately to Carlos Mattayo. Carlos responded with a visible gritting of his teeth, but he remained silent.

Hal knew an opportune moment when he saw one, and he seized on this one. "Since there seem to be no more questions, I will call for a vote on Dr. McKay's written proposal which you all have been provided. This includes the budget authorization as requested. Is there any discussion?"

Carlos responded immediately. "I'm still not convinced that we'll be getting our money's worth to continue on this project that so far hasn't shown a single shred of success." He started to go on, but Hal cut him off with a reply.

"To expedite the business of the consortium and the conduct of the research we have undertaken, Selene Industries is willing to assume the financial responsibility of any member of the consortium who wishes to resign under the provisions of the original consortium agreement. I now call for the vote."

All the representatives raised their hands, and Hal responded accordingly. "Thank you, ladies and gentlemen. The meeting is adjourned."

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Ian McKay stood in the centrifugally simulated 0.7 gravity of the Jupiter Trojan habitat. Since the wheel-shaped habitat had been constructed, power gates had significantly reduced the cost of remote power, and areas of the habitat had been altered to offer higher or lower gravity through use of gravity lens technology, but the unmodified wheel spin was still used in most areas. For Ian's purposes it made no difference whatsoever.

His eyes were on the frequency indicator in the upper right of his console screen. He watched as it slowly counted up to the eight significant digits he had been watching for the last hour or so. The indicator's digits suddenly stopped changing and turned red, along with a beep from the speakers on either side of the screen and the appearance of a new window in the center of the screen declaring that a frequency lock had been achieved.

To Ian's right, Brian Watson gave a whoop of delight. "We got a lock Dr. McKay." Even as he was whooping, he turned his head simultaneously with Ian's to look at the pedestrian-sized gate on the other side of the lab. The green lock-light was on at the top and the neutral gray interior of the gate looked like it usually did—blank.

Ian hit the key sequence that activated the video arm mounted to the side of the gate, and the mechanical arm with its camera extended smoothly through the gate interface. As it moved through the gate, the view screen on the left of the console showed an image of the other side. It was not Ian's laboratory in Scotland. It appeared to be an image of space, with a lot of stars visible.

Again Ian hit a series of keys on the console keyboard, and the camera began to pan slowly to the left. When the camera came up against its left pan limit switch, it stopped, and Ian provided more keyboard entries. The camera began to pan right until it came to its right limit switch, panned up ten degrees, and then panned left again. When it was about halfway through this new left pan, the screen went blank.

Ian's eyes shot to the console screen and saw the "Lock Lost" message flashing. He looked at the gate and the green lock-light had changed back to red. A quick key sequence on the console brought the video arm back to its original position—minus the camera and most of the mounting arm it had been on.

Ian and Brian hurried over to the arm to inspect the damage. As expected, the mounting arm was sliced molecularly cleanly, providing a polished-mirror surface at the cut. It was the kind of precision cut and micro-polish that could only be achieved through a gate disconnect. Industry had recently started making regular use of the phenomenon for manufacturing processes that required that kind of accuracy.

"Scratch one camera," Brian muttered.

Ian responded immediately. "Yes, but that's not important. What gate were we locked with? That's the question."

Brian was ever optimistic. "Well, there can't be many that open onto just plain space, Sir. It shouldn't be hard to identify."

"That's true. In fact, I'm not aware of any gates that open directly into space. Come to think about it though, with plenty of available power, and if the pressure differential dampers could be boosted high enough, it might make a decent airlock."

Brian gave Ian a blank stare as he absorbed the fact that Ian's brain kept spitting out new ideas even when he had it clearly focused on another problem altogether. "Do they make airlocks like that?"

Ian grinned. "Not that I know of. Not yet, anyway."

Ian sat down at the console, fitted the virtual Wanderer web on his head, and toggled on the gate here in the Jupiter Trojan laboratory that was crystal-locked with the gate in his Scotland laboratory. He waited while the mechanical servos made the optical cable connection to his Scotland computer. A system ready message opened on his console, and he was able to speak directly to his own familiar computer AI and systems. "System up."

He waited briefly for the security match of his identity and authority, and got to work. “Download the just completed camera survey of the tuned gate here at the Jupiter Trojan lab, and search for a match of star-fields in the Royal Observatory database. Confine possible vector origins to the solar system. Compare first, second, and third magnitude visible light sources, and save all ninety-five percent matches. Audible and console signal when the search is complete.”

Ian took the Wanderer off and turned around to talk to Brian, who was standing behind him watching the console display. He pushed out of the chair as he spoke to Brian. “We might as well go get lunch, it’ll probably take all day for a search that big, particularly without detailed instructions on how to conduct it, and that’s if the gate is located within the solar system. If the gate is an alien one, and is far enough from the solar system, we might be able to take a sabbatical before there’s a match. If there’s no match by the time we finish lunch, I’ll go to work on a refined search routine, but I’ll let the AI use a canned search routine to start. I’m hungry.”

Brian had his stunned face on, not that that was unusual when he was around Dr. McKay. “Did you say, alien?”

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Hal was at work. He was in his office, the lights were dimmed, and the holographic display in front of him showed an image of the robotic assembly of the Jeeves, model 24C41, domestic robot. Sales were beginning to soar, just as he had predicted.

The question he was contemplating now was whether or not to make the follow-on model more anthropomorphic. On the one hand, some functionality would be lost and additional costs would be incurred in manufacture. On the other hand, it just seemed the right thing to do as part of the evolution of robots.

The question had really been triggered by Selene Industry’s in-house staff of marketing psychologists. The written report they had issued on the subject, “Cultural Acceptability of Anthropomorphic Design in Household Robotics,” presented both pros and cons, but concluded that a gradual design integration of increasingly anthropomorphic characteristics was desirable by the majority of the potential market. His face-to-face meeting with the staff, however, left him with the distinct impression that they were pretty evenly split, with the report conclusion resulting from the fact that the department head favored robots that looked like people.

Harvey favored jumping right to the state of the art represented by the new version Jeeves that had been whizzing around Adam for the last three months, but as one would expect, Harvey was a techno-buff. The new Jeeves had a micro-laser holography shell projection system that made it appear amazingly human, but it would cost ten times the current model to produce, even in mass production, and five times the cost to operate.

To further complicate the matter, Linda had worked with Harvey on the advanced Jeeves, bringing her experience in dynamic sculptural holography to the effort. She favored the all-out approach too. That left Hal in the unusual position of being more financially conservative than Harvey on his decision to go slow, as the marketing psychology staff report had recommended.

Linda, of course, was never conservative about anything. If it were possible to take an outrageous position on any topic, she took it. It was probably the biggest reason he loved her. Hal spoke to the empty room, ““Love looks not with the eyes, but with the mind . . .””

Of course for Hal, no room was ever truly empty. Harvey’s response was immediate. “Much too easy, Hal, ‘A Midsummer Night’s Dream,’ Act 1, Scene 1, Helena’s closing speech.”

“It wasn’t a test. I was thinking of Linda.”

“Sorry. I did not mean to intrude on your thoughts.”

Harvey remained quiet, and Hal went back to his contemplation of anthropomorphic robots, while multiple Jeeves units were assembled in front of his eyes but invisible to his mind.

His reverie was broken by Harvey’s Dr. Serious persona replacing the assembly of robots. Hal’s attention focused immediately on Harvey’s visage. Harvey started with a curious message. “I have appeared as ‘Dr. Serious’ not because the news is bad, but because the news is truly remarkable and most likely historic.” With that attention grabber, Harvey continued. “Dr. McKay has just locked into a gate that is almost a thousand light-years distant from the solar system—nine hundred, and forty-seven, in fact.”

Hal’s reaction was guarded. “Could he have made a mistake about its location? That seems a bit far fetched.”

"There is always that possibility, but in this case, the chance is small. Dr. McKay sent a mechanical arm probe through the gate with a camera. The visible light image was apparently taken from space and showed nothing except a rather narrow vector of star-field. Before the camera could pan enough to widen the vector, the gate lock was lost, along with the camera and part of the probe arm."

"Obviously the vector was large enough to identify the location of the tuned gate if you know the distance from the solar system to the nearest light year."

"Yes, it was possible to identify the gate's location. Dr. McKay started a search through the Royal Astronomical Society's star records to identify the location, but I was monitoring his efforts at the Jupiter Trojan laboratory. When he tasked his computer system with the search effort, I interceded and wrote a special search program. I also opened the search to all the major star system databases simultaneously and dedicated some of the Selene computer resources to the effort. The Chinese database gave the first match, but I fiddled the match in the Royal Astronomical Society's database so Dr. McKay would think that he had serendipitously made a quick match. He is reading the results as we speak. It will be interesting to see what conclusions he draws from his search answer."

"It'll be extremely interesting. What do you think is going on?"

"The most obvious conclusion is that humans are not alone in the universe and that the tunable gate locked in on an alien gate. However, if that were the case, the camera would most likely have shown something other than space and stars. The answer will require another such lock and a more thorough probe."

Hal's eyes focused through the Dr. Serious projection while his brain was churning away on the information supplied by Harvey. Harvey was quite familiar with this characteristic of Hal while in deep thought, and he maintained his silence, waiting for Hal to speak.

"How long was the connection before they lost the lock?"

"Ninety-seven seconds."

Hal shrugged. "No wonder he only got a small sector with his camera. He had probably only gotten the camera through the gate when he lost it."

Hal went back to thinking, and Harvey remained quiet. "Tell me, Harvey, if he were able to lock this gate up again, could we push a twinned crystal gate through his tuned gate and then have a permanent entry to the location?"

"Of course, and quite ingenious, Hal. I hadn't thought of that. However, if it is an alien gate that is being tuned by Dr. McKay, the aliens might find such an intrusion unacceptable."

"What about the power requirement for that distance? Can we get enough power to the gate for it to work?"

Dr. Serious gave a chuckle, which always irritated Hal. "The answer to that question seems obvious. The power requirement for the gate lock was within the operating range of Dr. McKay's experimental equipment and the power for the camera's penetration was equally within range."

Hal punched his forehead with the heel of his right hand. "Okay, I missed it. There's a lot of things bumping into each other in there at the moment. How do we get this idea to Ian without letting him know you're monitoring his research efforts?"

"If he communicates his discovery with my Dowd persona, I can suggest the insertion of the gate. If he communicates with you as the chairman of the consortium, you can suggest the twinned crystal gate. I suspect he will want to talk over the problem with his colleague, Dr. Dowd."

"You're probably right. You guys have gotten tight over the last year of research effort. Whatever he does, keep an eye on him, and let me know what's happening."

As soon as the virtual lips stopped moving to the sounds of "Of course," the image of Dr. Serious faded out, and the assembly of potential Jeeves robots faded back in.

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Ian had just informed his friend, Dr. Dowd, about the strange connection he had made with the experimental, tunable gate. He had not yet told him where it was located. "I then had my computer attempt to match the images we had received to the Royal Astronomical database. I constrained the effort to consider the source to be within the Solar System, and I got the answer within three hours that no match could be found with a ninety-five percent accuracy on first, second, and third magnitude visible light objects. I continued the search by opening the parameters to a thousand light-year increments, and expected to wait weeks for an answer, if indeed I got any answer at all in my lifetime. But it must have

been my lucky day, because in only two days the computer found a match at nine hundred, forty-seven light years. With the volume of space to consider, I guess I just lucked out on the search order sequence.”

Dr. Dowd’s image on the wallscreen showed an excited response to Ian’s news. “Quite remarkable. Were you able to re-establish a lock?”

Ian’s response was much flatter than that of Dr. Dowd. “No. After getting a new camera installed, Brian and I tried all around the previous lock frequency all of yesterday, but we were never able to lock it up again. However, and I promise this is the last surprise I have, today, Brian and I decided to widen the frequency range to see if we could get another spurious lock, and we did. In fact, we got three more locks and sent the camera through to get pictures. We might have gotten more, but we lost the camera again on the third lock-up. The computer is working now to try and locate the new gate locks.”

“My, that’s quite remarkable, Ian. How long were you able to hold the locks at the new locations?”

“The first lock held for fifty-six minutes, the second for forty-two, and the third for only seven. Not much of a pattern there, is it?”

Dowd’s mouth pursed as he appeared to be considering whether or not the three lock times represented any kind of pattern. “Well, yes and no. You couldn’t really call it a pattern, but all four of the gates you’ve tuned into have drifted fairly quickly. Did you try re-acquiring these new lock-ups?”

“Yes, we did. No luck.”

“And you’re sure it isn’t the frequency on your end that is drifting? If it’s not, it must be the other end that is shifting. Were they all in space, with just star fields visible?”

“They were all in space, but one of the images clearly showed a planet or moon, along with some other objects that could have been more distant planets or moons.”

Harvey decided that he had played the conversation long enough to throw Ian off the scent. The Dowd persona looked directly at Ian. “Well, you have been truly tantalized. The next time you tune one of the mystery gates, you have to put through a crystal-locked gate. That way you can get back to the same location and make a proper survey of the surrounding environment, assuming of course that the owners of these gates don’t object.”

“Owners? You think I’ve tuned into someone else’s gates? Like aliens?” Ian sat back with a quizzical look on his face. “Well, I guess I must have. What other explanation could there be?”

Dowd said nothing that would interrupt Ian’s train of thought, and after a moment, Ian continued. “You mean just push through a crystal-locked gate? That simple?”

“Well, not quite that simple. They would require an initializing power source, and they would benefit from some kind of stabilization system. But stabilization could be attached later if the gate proved connectable from our end. It certainly wouldn’t be difficult. Do you have any small crystal-locked gates that would be suitable for such an effort?”

“No. I’m afraid not. Gates are quite a large budget item. I would have to go back to the committee, or at least to Hal Neilson.”

The excitement seemed to come back into Dr. Dowd’s face as Harvey pressed his position. “Have you told Mr. Neilson about your discovery yet? It seems to me that a discovery of this magnitude would surely provide access to additional budget. I’d ring him up right away, if I were you.”

“Yes. I will. Right away. Thank you Elwood. As usual, you’ve been a great help.”

“You’re quite welcome, Ian. Anytime. And keep me updated on your progress, if you will. It’s fascinating.”

Ian waited only until Dowd’s image faded from the screen. “Computer, connect me to Hal Neilson.” As he waited for the connection, he mused about Dr. Dowd’s last statement. “Ring him up,” was a rather quaint phrase for a physicist.

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There was a fog rolling over the snow on the cliffs facing the North Sea, but it didn’t get all the way to the laboratory before it attenuated and finally dispersed. He was coddling his teacup, looking out the large northeast-facing window, trying to grasp the idea that had been fleeting by him for days. He could feel it trying to whirl up into his consciousness, but when he tried to grab it, it flew away without a trace of its form remaining.

The excitement of putting gates out hundreds of light-years away from the Earth that could be used to explore the galaxy had kept him awake most of the last few nights. In that excitement and sleeplessness his mind had been racing, trying to find some rational reason that fit the irrational fact of these mystery gates.

He still didn't know how Hal Neilson had been able to get the first two crystal-locked gates to him in less than an hour, but he was even more amazed when a trio of gate couriers brought in six more the next day. They all had initializing power supplies and standard power links attached to the frames for the remote gates. He had dispersed five gates as of yesterday that were now power-linked and functioning.

He was supposed to receive the first stabilizing units today, along with technicians to install them from Selene Industries. Brian should be in shortly to finish installing the new gates and survey cameras into the crowded back room of the laboratory. Having the gates here in the Scotland laboratory was not exactly an efficient solution to the space problem, but the Jupiter station lab had even less room. The gated power supply came from Selene Industries, and Neilson had told him not to worry about it until they could arrange a commercial source and get the consortium's budget approval.

The energy requirement differential for two of the gates was enormous when they were moved from the Jupiter station to his Scotland lab, but the power requirements of the other three went up only an average of 25 percent. He still had a very incomplete set of the factors that drove power use for jump-gates. If the two to three ratio held up for future gates though, they would have to find a Trojan habitat somewhere that had some room. And for any high-mass use of the gates, even the twenty-five percent inefficiency was too much to be acceptable.

He tried to hold his excitement down a notch by not thinking about where the computer would determine their locations to be as he left the window with half his cup of tea and went to his desk. As he went to find a level spot to set his cup, he remembered the morning more than a year ago when the placement of his cup had altered his life. He could use a little of that same magic about now.

Ian reached for his Wanderer to start the day, but as he did, the illusive idea snapped into focus. Of course, the original teacup trigger was the answer to this problem as well as the one that put him on the path to using Trojan points. What if the same interactions of mass and gravity that made it easier to establish gate connections at Trojan points also produced natural gates.

Yes, he liked the idea. Natural gates at the points in the universe where there was the greatest stress on the spatial fabric, where the interactions of mass and gravity pulled each other to balance. And not a simple balance, either, but a dynamic one where the balance point was in constant motion with the complex motions of the orbital masses involved. That might explain the changing frequency of such natural gates.

He needed to talk to Dowd—a calibration on his thoughts. He reached for the Wanderer again, but halfway to it he remembered that it was the middle of the night in the U.S. He jerked his hand back in a spasm of pique, and his elbow struck his teacup a glancing blow. It wobbled twice before it teetered off the edge of the desk and into his lap.

His anger at his clumsiness faded quickly with the thought that dumping his tea in his lap might be a sure sign of another good idea.

## Part 4

# Blind Gate's Buff

The No. 10, Green Drake settled gently to the crystal clear water, just into the fast moving race around the rock edge. In less than a second, the cutthroat had struck and Linda had a firm hook set. The fight was on at the end of the 4-weight line, where the trout tugged valiantly at the number 5 tippet and ultimately on Linda's arm. She stripped the trout in with her left hand, clasping the line between the fingers of her right hand and the cork of the handle at each downward stroke of her left hand.

The trout came up to dance on the surface, throwing crystal sparkles in the bright Wyoming sunshine. Only once did she have to let a few yards of line slip through the finger and cork brake she had made of the rod handle, as the trout made a run she was afraid might break the tippet in its determination.

She brought the trout with its bright rosy cheek to hand and slipped the barb-less hook from its mouth. Looking at the show of colors on the slick-wet fish, she decided to put it in with the one she had creeled about thirty minutes before. It was a good fifteen to sixteen inches long and she knew it was close to the time when Hal would want to start back.

People at cocktail parties might still ask her how she could take and eat a real live trout, but her friends never did. She was not the personality type to take up vegetarianism to save the world's wild creatures. She was much more proactive about conservancy. It never made sense to her to ignore the obvious workings of the food chain in nature. There was a chain of eat and be eaten that only stopped at the top, and she was damned if she could see anything wrong in it.

The two trout in her creel were destined to fulfill their destiny in that chain tonight—on her dinner table, broiled under a glaze of fresh garlic and thyme butter. And she was getting hungry about now. The breakfast bar and fruit juice she had dug from the back pocket in her vest was losing its impact in her digestive system.

She checked her footing on the slick rocks of the bed and turned around to face downstream. Although there was no one in sight as far as the eye could see, she started talking in an ordinary voice. "Harvey, how far behind me is Hal?"

Harvey answered with his usual penchant for accuracy. "Eighty-three point two meters on a direct line and one hundred, six point seven meters along the bed of the stream."

"That's 'as the crow flies,' Harvey, not 'on a direct line,'" she retorted.

"Actually, I have made numerous observations of the flight of crows, and I have determined that the use of that phrase is oxymoronic. I will continue in my more accurate use of the language rather than interjecting the inaccuracies of this and many other colloquialisms."

Linda hooked the Green Drake on the retainer loop just above the rod handle, turned the reel slightly to get the slack out of the line, and started back downstream to find Hal. It took about fifteen minutes of carefully negotiating the slippery streambed before she saw him. He had his right hand in the water, the rod in his left. He was obviously releasing a fish he had just caught.

As he straightened up, he saw her and gave a little wave. The white-noise of the flowing stream made it impossible to talk over any distance. Of course he could have communicated through Harvey, but they were both out here for the solitude as much as the fishing, and neither talked any more than necessary when they were out on a wilderness trip.

Hal did speak to Harvey though. "Harvey, have the mini-bots open a gate for us. I think we're finished for the day. Yond' Linda has a lean and hungry look."

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"You only caught two?"

"No, I only kept two. That's more than enough for two people our size. And I gave you the larger one out of the goodness of my heart as it was, which you would have known if you hadn't flown to the news as soon as we gated back. I had to practically whip you to get you to take a shower before dinner."

"You never mentioned a whipping. I would have gone gladly afterwards."

Linda smiled sickeningly sweet across the table. "Bullshit."

Hal responded with a genuine smile. "You know me too well for me to even rib you a little. Besides, you said it was your turn to fix dinner, and you didn't trust me to prepare your hard caught trout after my last foray with the filet knife. I have to practice if I'm going to learn, you know."

"Well, you can practice on your own trout, if you ever learn to catch any big enough to keep. And you don't know any places to go on your own that you have even a chance of catching one big enough to keep. You're lucky I think you're cute. My granddaddy told me that you never tell anyone about a good fishing place, and if anyone asks you how you're doing if they come across you accidentally, you say 'not much luck today' or 'a few small ones.'"

"Your granddaddy must be a trip."

"He's still a hell of a fisherman. He can roll cast further and more accurately on a windy day in a tree-congested eastern, brook trout stream with a six-foot rod than I can cast with a nine-foot rod in a wide-open western stream like we were in today. And it's a rare fish that takes his fly without getting hooked. Even at eighty, he has hook-setting reflexes like a tripped mousetrap. I really miss trout stream fishing with him a lot. He just can't climb over the rocks and make it up the hills anymore, but he still fishes from his kayak and on foot in the Pamlico Sound."

Hal could see the tears start to form in the rims under Linda's eyes and hear the catch in her voice. He rushed on, trying not to let her dwell on the fact of her grandfather's age, but it actually sounded like he wasn't all that infirm yet. "Did you ever fish Coldwater Creek with him?"

"Twice. He found it on a fishing trip with my dad. We're a fly fishing family."

"Well I sure do appreciate you showing me the finer mysteries of the sport. I had only dabbled before. Now I'm beginning to get good enough to really enjoy it. I've been reading that it's great for saltwater too. Have you done any of that?"

"Some. Only the Bahamas and Belize. It's fun, but it's not the same sport as putting a dry fly gently into a trout's feeding lane. However, once you get the fish on, it's difficult to beat a hard running bonefish or permit. If you want to give it a try, we'll go saltwater next time. Or maybe I'll take you down to the Outer Banks for some speckled seatrout fishing, if I can convince my granddad you're worth taking out."

"Do I get to read up on it and buy some new gear?"

Linda rolled her eyes and the near-tears were gone. "You little boys are all alike. You love the gear more than the sport, but yes, you'll need all new gear and a lot of sunblock."

"Oh, goody."

Linda shook her head *and* rolled her eyes. "Jeeves, you can serve the strawberries and cream now, and bring a little Grand Marnier for the two us, please."

Linda couldn't keep from adding the "please" at the end of her request. The damn robot looked absolutely real. It would have taken a major effort to remember it was not a person. And it wasn't Harvey like it was at first, before the new software was finished and installed. It was just a perfect holo-image surrounding an anthropomorphic metal shape. According to Harvey, the image was a stylization of P. G. Wodehouse, the author that had forever made the name Jeeves synonymous with the English-speaking butler. Of course Harvey's use of the Wodehouse image and the name Jeeves was more diabolical. He claimed it was his response to many of the Bertie Wooster-like antics of Hal. Hal refused to comment.

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Ian sat at the experimental gate control station of his expanded research facility in the rolling hills of Scotland. His eyes followed the sweep of stars visible on the screen in front of him as the camera panned systematically from its orbit around the as yet unidentified blue-white star.

This was the first of the randomly dispersed, twinned crystal gates to be stabilized with the equipment from Selene Industries. With the gate stabilized relative to the central star and the gate's orbit around it, it was finally possible to do the detailed star survey needed to conduct a computer analysis of the gate's location. He hoped he would have the same kind of luck on this computer analysis as he had on the first one. And he might, since Hal Neilson had offered him access to Selene Industries raw processing power as an adjunct to the Royal Astronomical database via data-link gate.

The nearby gas giant started to creep into the screen's lower left quadrant, and Ian knew the camera had completed another 360-degree sweep and changed its angle to the star's planetary plane in preparation for yet another sweep. The survey was just about complete, and Ian pushed impatiently back in his swivel chair.

Waiting for the computer to produce analytical results was always the hardest part of any research activity. All sense of time seemed lost when he was actively involved in the experiment, but he was painfully aware of the molasses-like flow of computer wait time. If he had multiple cameras, he could speed the process up and have something active to take his mind off the wait, but a budget was a budget, and his time was cheap.

Ian could hear music from the back room where Brian was checking out the stabilization assembly they were going to put through the next twinned crystal gate. Busy hands; that's what Ian needed. Instead, he got up to make another cup of tea and to relieve himself of the remains of the three cups he had already consumed, and it wasn't yet noon.

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"This is the Fourier-Net six-o'clock news, and I'm Jim Postner. Results were announced today by the United Nations Science Directorate on the research of Dr. Ian McKay, who has been studying the possibility of a jump gate that would use a tunable circuit rather than the expensive twinned crystal gates that we are all familiar with. Not only has Dr. McKay and the industrial consortium supporting his efforts been successful in producing a tunable gate, they have apparently discovered the existence of gates that appear naturally in the universe.

"For scientific insight on this discovery and for speculation about its possible implications for mankind's exploration beyond the solar system, we have with us Dr. Clark Isaacs, noted physicist, popular science writer, and creator of the classic "Steel Rendezvous" science fiction series here on Fourier-Net. Dr. Isaacs, welcome to our show."

"Thank you, Jim. I'm happy to be here at this very propitious moment in human history."

"Propitious moment. Just what do you mean by that cryptic phrase, Dr. Isaacs?"

"I mean that you and I might be living through a defining moment of human history. The time in which man goes out to the stars. The time in which he fulfills his destiny to bring intelligence to the universe."

"But tell us Dr. Isaacs, what if the universe already has intelligent beings populating it? What happens if we find ourselves not alone in the universe?"

"Well, Jim, as a life-long science speculator, I certainly concede the possibility, even the probability of finding other life forms. The probability of finding life that is intelligent is much more questionable. The question of extra-terrestrial life flies firmly in the face of many of humanity's great religions, as we have seen with the discovery of simple, extra-terrestrial life forms right here in our own solar system. If these discoveries of simple life forms stepped on the lines between Darwinian biology and religion, the discovery of intelligent extra-terrestrial life will be a giant leap across that line."

"Uh, yes, Doctor, but aside from the religious questions, what are the possible dangers of going out to these other stars that are being found and opened up to potential exploration?"

"Well, Jim, we might just find another intelligent race as aggressive as our own. Wouldn't that be a hoot? It would be impossible to predict the outcome of that kind of discovery. We might also bring back micro and macro life forms that could destroy the environment or simply kill us all with a deadly plague. On the other hand, the possible benefits from explor . . ."

"Is it really that dangerous? Should we be out there on strange planets at all?"

"There are some dangers, yes, and we must be careful to strictly limit exploration to scientific inquiry until we can adequately assess them. But the potential benefits far outweigh . . ."

"I'm sure there are plenty of *possible* benefits, Dr. Isaacs, but you're saying we could bring back a bug that could kill us all."

"Yes, it's possible, but the chance of that happening . . ."

"Is even a small chance worth any *possible* benefit? I think not, doctor."

"Before you jump to that conclusion, let me tell you how significant the benefits could be for all of mankind. First, we could . . ."

"I don't mean to cut you off, doctor, but right now we have to go to a commercial and then on to Katie Kallin's analysis of the controversy surrounding the Westminster dog show that aired on Fourier-Net last night. This is Jim Postner, see you all tomorrow night when our guest will be Bishop Jesus Yng of the God's Children Church"

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Hal's eyes were burning and he'd had so much coffee that his eyelids twitched like the rest of his body. Even without the caffeine, he would have been torqued by the idiocy exploding in the world. Harvey had pulled together a whole week's worth of telenet news shows, interview shows, and netpaper and netzine articles that reported on or fueled the outcry against extra-terrestrial exploration.

About five percent of it was well informed and well intentioned. The rest of it was ill-informed babble or carefully composed misinformation. It all depended on who was grinding which axe.

He had managed to hold the consortium together while expanding their mandate from tunable gates to blind gates and the exploration of new worlds, but it hadn't been easy. None of the companies wanted to be identified with a plague or environmental destruction, but on the other hand, they were all quick to see the potential commercial benefits of new frontiers and resources. Hal's plan to operate in the lowest possible profile mode got their interest, but greed won them over. They just couldn't resist the potential profits and market dominance offered by exploring new solar systems.

And just what was the right decision about the risks involved in exploring other star systems and their planets? How did one come to grips with *any* chance of destroying the earth's ecosystem through the inadvertent import of some alien bio-form? What could make the risk worth taking from a non-economic point of view? How safe could exploration be made? Was there any true danger from radically different alien life forms? Would alien life forms be truly different? Hal's brain ached.

"Harvey, listen up. What do the scientists say about the possibility of a stray alien life form causing havoc with the earth's ecosystems, specifically the human race? And I just want a summary of current thinking."

Dr. Serious manifested in the chair opposite Hal. "To answer your question, I have to point out that there are really two problems, not one. First, there is the danger from microorganisms that might attack earth's ecosystem like bacteria and viruses or single and simple cell organisms like algae and yeasts. Second, there is the long-term risk that macro or microorganisms would compete for ecological resources and win to the detriment of the earth organisms. Having placed these two possibilities on the table, so to speak, there is, as you would imagine, a wide divergence of opinion on each issue. However, the great majority of scientists feel that the most that might be expected of the attacking microorganism threat is the same level of risk that might be expected from a recently mutated, indigenous virus. The reason they give for this assessment is that if the alien life forms are very different from those of earth, they will not be evolutionarily equipped to mount an attack, and if they are similar enough to mount an attack, they will also be similar enough to be countered like earth evolved bacteria and viruses. When this is coupled with today's level of medical science, the scientists see little chance of a serious pandemic or even epidemic from inadvertently imported alien life forms."

"So we couldn't have something like the AIDS or Tasmanian Flu problems of the first half of the century?"

"Of course, there is always a possibility, but the data seems to show that the risk is not significantly higher from an alien source than from a terrestrial source. However, the second problem of alien life-forms competing for environmental resources and ultimately displacing some earth-evolved forms is not so clear cut. There are many examples in the last few hundred years of this sort of thing happening just from species being transported from one region to another on the earth during the expansion of Europe to the New World like the rabbit in Australia or the rainbow and brown trout in America. Then there was the boom in international commerce of the Twentieth Century that spread the Mediterranean fruit fly and the Asian zebra mussel. All of these were expensive and troublesome complications for society, but looking back through the biological and geological records shows that these things happen anyway due to natural causes as well as those caused by human intervention in the ecosystem and usually with equally drastic results. The saving grace is that the earth's ecology has proven its resilience more times than we can count. Consequently, the scientists also give this a low risk factor for having a major impact should it occur from an alien life-form."

"Damn, Harvey, I said a summary, not a lecture."

"Issues this complicated cannot be intelligently discussed in a summary fashion. I have compressed the information as much as I thought reasonable to still allow for your comprehension."

"I know it's complex, Harvey; you don't have to patronize me. I'm struggling with what to do here. Do I take the risk and charge ahead for the possible betterment of mankind, or do I pull the plug on this project?"

"While I do not wish to sound patronizing again, it seems a bit presumptuous that this is your decision to make."

Hal stared at the screen for a long minute and then visibly relaxed. He slumped back in his chair. "Touché."

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Adrian Kimball-Smythe was not much more than a clerk with good skills in technical editing and computer graphics at the research station and rarely had any contact with Ian McKay. He did, however, have regular contact with the research staff that integrated Dr. McKay's research results and prepared his research reports for the monthly meeting with the consortium. As such, he had been discreetly contacted early in the effort by both Syntech and Gumphata, though he didn't know their identities. Syntech's contact had been from a stranger sitting down at his table in the Hen and Egg during lunch, and the Gumphata contact came while downing a pint of bitter at the local pub. Both wanted exactly the same thing and were

willing to pay well for it. So well, that he would be able to take a year off for his dreamed visit to Australia and New Zealand when the project was over.

All he had to do was provide the companies with a data chip of the latest research results when they got correlated rather than them having to wait for the scheduled meeting to get the same information. On the face of it, it seemed like he was getting paid for doing nothing but streamlining project communications. Certainly, there was nothing wrong with that. Of course, Adrian was no idiot and knew that they wanted the early information to get as much of an edge on their real-world competition as possible, but so what? Why shouldn't he make a little for his efforts, which included the almost daily deliveries of the data chips at lunch or in the pub. Both contacts had been adamant that there was to be no contact other than through the delivery of the data chips.

When the gate was finally successful, the whole staff was elated for days, with a lot of talk and excitement buzzing throughout the facility. Adrian joined in the buzz and looked for an opportunity to make something out of the recent success for himself. His chance came when Dr. McKay started playing with the tunable gate circuit diagrams. It was a well known quirk of the Doctor's that he would tweek and tweek and tweek before he was satisfied with releasing a new design. That meant it could be weeks or even months before the consortium members would get their hands on the final circuit diagrams for the tunable gate—unless they had his help.

Adrian put the squeeze on both his contacts for a much bigger payment for the diagrams, to be delivered as they were updated with the Doctor's latest refinements. By this time in the project, they seemed as knowledgeable as he was of McKay's idiosyncrasies, and it was easy to convince them to up the ante. In fact, he was able to get them to up it enough that the fact the project might soon end with this recent success didn't bother him at all. He would be able to take that long-dreamed-of trip all the sooner—maybe even consider emigration.

As it turned out, he was right on target about the Doctor's propensity for tweeking. It took a month-and-a-half before McKay formally issued the circuit diagrams to members of the consortium and made them simultaneously available to anyone on the Web. But two of the companies were not surprised by the details of the circuit designs, they had seen them in almost the same configuration a month earlier—a close enough version for their own teams paralleling Ian's efforts to build and operate their own tunable gates.

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Keendo worked slowly back and forth across the stream lifting the sand with his feet to let the current sweep it behind him. While, trudging with his feet, his scoop-bladed paddle dug rhythmically into the sand, scooping, lifting, and turning. It was monotonous work, but it couldn't be done automatically, if one valued his feet. Frequently the sand was only a thin layer, with large chunks of sharp stone hidden just below the surface. He concentrated.

The water of the small mountain stream rushed past him carrying the sand into the pool below. Here the current washed up against the large stones he had piled across the stream in the morning. The stone dam was the first item on each day's work list for the last seventeen days.

Keendo had been gone from the summer encampment for twenty-three days, and he was looking forward to the return trek tomorrow. He was tired and found himself hungry much of the time. But his spirit was high, soaring as it always did when he spent many days and nights alone in the rough stone beauty of the mountains. It was as though the river washed through his spirit as well as his toes.

Keendo glanced behind him to see if the cloud of sand he was kicking and spooning up was still reaching the pool before settling out. The rushing water was guided to the side of the pool by the rock dam sweeping out into the streambed in a long spiral that curled the water back upon itself at the downstream end. The water in the pool swirled around and around and gradually spilled over and through the rocks. Keendo smiled and moved his feet further up the stream, trudging, scooping, lifting, and turning. Over the last few years, Keendo had tried many times to improve on old Ojo's teachings of the correct design for the rocks and catch-pool, but so far he had not.

Ojo was old when he took Keendo in as his apprentice seven years ago. He had long been under pressure from the Council of Elders to select an apprentice to train in his art but he had steadfastly insisted on waiting for a young man with just the right bend in his spirit. When Ojo finally made his selection, the elders weren't happy about that either. Keendo was a promising young hunter; strong, good eyes, good reflexes, and already clever enough to plan the tactics for a successful hunt.

In the end, the importance of Ojo's art enabled him to win Keendo as his apprentice. But Keendo was not happy. Keendo had worked hard to learn the secrets of the hunter, and his prestige among the

young hunters had been growing daily. Keendo enjoyed having the others come to him before the hunt and discuss their strategies of concealment or weapons.

But Ojo had just smiled at Keendo's belligerence at his apprenticeship because he knew Keendo had no choice. The belligerence didn't last long anyway; Ojo worked it out of him.

Keendo smiled as he trudged and spooned, remembering Ojo's lessons. Many hours were spent as Ojo drew sketches in the earth with his walking stick. At first Keendo could only see Ojo's sketches as swirling, curving scratches in the earth. As the days went by, and Ojo's soft but steady voice went on and on about the water, the rocks, the gravel, the sand, and the flakes of yellow metal, Keendo's mind began to build a picture. Soon he could see just the pattern that the water would make as it rushed around a smooth curving rock, or as it moved around a sharp-sided rock, or as it sped through a narrow passage.

Gradually, he could almost hear it, smell it, and feel it running over his feet. When Ojo could see the picture of the stream in Keendo's eyes he took him to the water. For two days Keendo stood on the bank and watched old Ojo as he gathered and placed rocks in the streambed. With each placement came a discussion of its exact fit and alignment, and questions for Keendo as to what the resulting current patterns would be above and below the rock. Slowly, for he was old, but carefully, for he was a good workman, Ojo showed and explained how to catch the yellow metal, oke, with a properly constructed catch-pool.

Then it was Keendo's turn. Every day for fifteen days Keendo was in the river building catch-pools. At first, Ojo worked beside him, stopping him as he would place each stone, discussing its angle, checking the fit. The first couple of days Keendo found it exciting, a welcome relief from all the days of talking and watching.

As the days passed, he became tired and bored and arrogant, but he learned. In the end, Keendo could walk along the stream selecting the spots where nature would give him the greatest head start and then construct a dam with just the right curvature to swirl the waters and with just the right fit between the stones so enough water would spill through and enough water would spill over to keep the pressure from being irresistible. Just above the pool he could set the stones running across the streambed so they would start the water into just the right curving motion as they entered the pool.

Keendo glanced behind him again watching the swirl of the water into the pool, and knew he had worked as far upstream as it was practical. Turning, he paused for awhile allowing the sand that he had kicked up to be swirled down into the pool and slowly began the trudging walk back downstream that would again stir up the sand and any oke that had settled too quickly to reach the catch pool.

It was difficult this time of day to look down through the clear water. With the sun almost directly overhead, each swirl of the water was a dance of light. Keendo was looking to see if he had uncovered any chunks of metal that were large enough to be seen with his eyes. He never found many, but the few that he did find were enough to make the search worthwhile. This time there were none, and as he moved into the deeper waters of the pool, the grinding in his stomach told him it was time to eat.

Keendo's midday meal was simple. It was the same as it had been almost every day since he had left the encampment. The dried pulp of the noola fruit and thin strips of brogandi dried in the sun and smoked in the big spring-kill ovens. Keendo had only allowed himself time for two hunts for fresh game on this oke trip. It was as though the sun spirit himself had set the amount of labor required to build the catch-pool, work the sands upstream, and extract the oke from the sediment at the bottom of the pool. It was only on days that the oke catch was poor that Keendo would allow himself the time to search for fresh meat, and this had been the best oke trip that Keendo had ever made. Old Ojo's eyes would sparkle when he felt the weight of Keendo's pouches.

Keendo reached into his trail sack and removed his hammered bacca pan. Bacca was one of the other metals that Ojo had taught him to work but it was not as easy to get or to work with as oke. Bacca was bright white when it was first melted from crushed bacca-stone in the clay oven built just for making bacca. Ojo had taught him how to make this oven and how to find the bacca-stone just as he had showed him how to catch oke. While bacca started out white, it would quickly become discolored almost to total black unless it was polished frequently, and it was this turning of color that made it a valuable tool in taking the oke from the settled sands in the pool. Ojo had made this pan many years before, and Keendo himself had blackened it many times over the low coals of the camp fire into which he had thrown the yellow rock crystals that made a foul odor.

Keendo stood in the center of the catch-pool swirling his laden pan, sloshing the water and sand over the side. Again and again he dipped up sand and water from the center of the catch-pool. This was

the monotonous part of the day, but it was one of Keendo's favorites for he could let his mind float, almost as if it was out of his body, looking down watching him at his work. Time and again, Keendo reached over to the leather pouch sitting on the rock at the edge of the stream and scraped the yellow flakes from the bottom of the pan. It had been a good day, maybe his best.

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The Syntech CEO's conference room was high enough to look down on most of the roofs of the Manhattan skyline with a backdrop of the East river. The view, however, was designed to be through the window behind the head of the conference table where a smug and imperious Daryll Jelks reigned over his staff. "I'll start this meeting by telling you what you all know in one form or another. Our mirror team has been successful in duplicating the McKay tunable gate circuitry. What some of you might not know is that we've also been able to tune into a series of these natural gates that McKay has found. Where our quick looks through these natural gates have shown a nearby asteroid belt or a planet that appears to have the characteristics to support biomass, we've inserted a twinned-crystal gate. That work is continuing on a twenty-four hour a day basis, and we're adding staff to the effort as fast as we can find qualified people. We're also working 24/7 on more intensive surveys of those areas of space that we can now access through the implanted, crystal-locked gates.

"The reason for this meeting is to review security surrounding the mirroring project and to make sure the priority level the corporation has established is extended to all development activity. Let me make it perfectly clear that a significant investment has already been made in the mirroring effort, in the planning, and in the exploration logistics pre-staging for finding something to justify that investment. Everyone at this table will give two hundred percent to seeing that we have something of value flowing through these gates before any of our competitors in the consortium. Is that clear?"

Jelks swiveled his head slowly enough to look each of the staff at the oval table directly in the eye and receive a nod of the head. It was a ritual they all knew. When he had completed his swing around the table, Jelks gave a brief shake of his head and continued. "Now for the good news, I just got confirmation from a gate survey team that one of the biomass planets has shown a ninety-six percent probability of major petroleum sources on many areas of the planet's surface. This data was only from automated geo-survey satellites, but we're right now preparing to send through a planetary surface exploration team to do exploratory drilling at the best looking site. All this costs even more money, gentleman, and I don't want it going down a rat hole."

Now that he had finished the background and philosophy, Jelks was ready to provide direction, and his diatribe continued. "Carlos, I want you to personally take control of this effort with the goal of having crude oil pumping through a low-energy gate in two weeks. That's pushing it a bit, but all the equipment has been staged for gating and the crews are standing by, so I expect it to happen. We'll initially take crude to our Wayfarer refinery so we can claim to be first to exploit the potential resources of blind gates, but the real pay off will come when we can refine on planet. Refining on planet means we only pay gate energy costs for refined products and pay nothing for drilling mud cleanup, gas re-injection, pollution control scrubbers, and all that other crap we have to pay for when we refine under the control of the UN.

Jelks' glare moved from Mattayo to Wyandotte. "Charles, I want a media-wide PR plan on my desk by the end of the week that will keep the bleeding hearts off our doorsteps. The press has the eco-nuts screaming that all the earth's creatures are going to be wiped out by an invasion of alien plants and animals and everybody else is scared that some kind of plague is just waiting to jump through a gate and kill all the people on the planet. We can't turn the press around by ourselves, but we need to push our bio-safety expertise and make up a whole new set of standards we can claim are being applied to extra-terrestrial development."

Charles looked confused by this direction from Jelks that he knew was significantly different from the contingency planning they had all been operating with for weeks now. "You want to up the level of bio-containment to something more than standard 'Bio-Hazardous'? That could take a while to implement, Daryll, we would have to . . ."

"No! you idiot, I don't want to do anything that's going to drive the cost of this operation any higher. I just want the press to tell the public we are taking extraordinary measures to safeguard the earth's precious ecology, not to mention its inhabitants. Flim flam, Charles, that's what you do, remember?"

Charles ducked his chin, cowed by Jelks' venom. Jelks shifted his eyes to Geoff Brabham. "Geoff, I don't want even a hint of what we're doing to get to the press until we're pumping oil and the press release is on the street. I know that the crews don't have a clue as to where they're going, and I want to

keep it that way. Once we gate people to this new planet, I don't want them coming back until we've put the word out. They can't chat with the press when they're a thousand light-years away."

The heads around the table snapped up with the thousand light-year comment, and Jelks plowed on. "No, just a figure of speech. We still don't know where this planet is, and the scientists tell me we aren't likely to know until we go public and get access to big enough databases to find out. Then again, what difference does it make where it is? The only thing that matters is how much energy it takes to push cargo through the gate and ultimately, who owns the place and its resources."

Jelks eyes moved again, this time skewering Paul Tulley, the corporate legal eagle, and Tulley gave him back his sturdiest and most dispassionate courtroom gaze. "Tulley, I want you ready to tie up these UN goofballs for years over the rights to new planetary resources. The chatter I've been reading that's coming out of the UN's Commission on Extra-terrestrial Rights is the same old stuff that's bogged us down on the moon, Mars, and Ganymede. Of course, their indecision hasn't kept us from 'makin' hay while the sun shines' there either. I expect that to continue indefinitely into the future, even though the sun may be a different one."

Tulley said nothing, but took his direction with a nod of the head and his usual incessant scribbling on a yellow legal pad. Jelks had finally gotten to the last of the staff at the table. "Willi, there isn't much you can do in a situation like this to control spending, but by God there better not be anyone that thinks they can take advantage of my open pocket book for feathering their nest or pet projects I've already pissed on. You watch 'em like a hawk." He finished with an evil grin he sprayed around the table; then he stood up and waved them all out.

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Hal sat sprawled across the big sofa in the rec-room on Adam. With a single raised eyebrow, Linda nodded her head toward the Jacuzzi. "You getting in for a while?"

"If I can find the energy to get undressed. My body is currently directing all its efforts at digestion. I don't know why everybody always trashes English food. I love it."

"That was apparent from the volume you ingested, but then again, you've always been a meat and potatoes kind of guy."

"Hey, that's not fair. You know I love the fancier stuff too. Don't I make you great meals when you're here?"

Linda's face softened and she leaned down and pecked him on the cheek, while busy with the fashionable buttons down the front of her dress. "Just jerking your chain, dear. It's been a while since I could have some fun. Work, work, work for the last month, and I'm sick of it . . . for a while at least."

With her clothes draped over the back of the sofa, Linda stepped over the rim of the Jacuzzi and sank into the warm water with a sigh. The door to the hallway opened just as she closed her eyes in synch with her body beginning to relax, and Dr. Serious walked into the room and took a seat in the chair opposite Hal. "Can we chat for a minute, Hal? I acquired some rather important information concerning Syntech this afternoon, and I have waited until your return from the London showing to relate it to you."

"Really important?"

"Yes, Syntech, as you know, has been busy dropping off twinned-crystal gates as fast as they can tune new natural gates and determine they have potential value. Syntech had a board meeting today with a presentation by their chief scientist on the mechanics of finding natural gates, inserting crystal-locked gates, sending through automated probes, and other details of exploring asteroid belts and planets for exploitable resources. The big news was their discovery of a biomass planet with a high probability of large petroleum deposits.

"Daryll Jelks followed the Board meeting with a meeting of his staff and directed that exploration begin immediately and exploitation as soon as possible. They plan to be pumping oil back to their earth-orbiting polymer plants in two weeks and are planning a media campaign to accompany their announcement when pumping begins. This is basically what we have expected since we discovered the data leak in Ian's group, but the bad news is that Syntech is making no efforts at bio-safety beyond the industry standard 'Bio-Hazardous', regardless of what they will be saying in their press releases. They are very concerned about the money they are expending on this effort."

"You used the right word," Hal grouched from his slump on the sofa, "exploitation. I guess the Board or Jelks himself doesn't believe in the bio-contamination danger, but since it impacts the bottom line, they'd ignore it even if they did."

Linda had listened quietly to Harvey's recitation of the day's events, while continuing to try to reach the level of relaxation she thought her hard work had earned her, but as usual, holding her tongue on this topic was more than she could do. "So what contingency plan do you guys have worked up for this? And while you're at it, what's the progress at the UN in getting some kind of controls in place for the wave of both exploration and exploitation we know is coming?"

Harvey's persona looked at Hal and waited. Hal squirmed nervously on the sofa and remained silent. Linda rose to a sitting position in the Jacuzzi. "You guys have known this was coming for months, if not the last year, and you don't have a contingency plan?" she spat. "Well, Momma's back in town, and we aren't going to sit around and let Syntech roll along with business as usual. So put on your thinking caps and don't plan on leaving this room until something comes out besides charred sawdust and fried electronics."

Hal groaned. Dr. Serious smiled and gave Linda a short primer on the usual bungling and stalling at the UN when big business ran head-on into social needs. No regulations were forthcoming and none were anticipated in the near enough future to make a difference in the risk of alien bio-contamination. Harvey ended the primer by reminding both Linda and Hal that while there was a good chance of impact from such contamination, there was very little chance of the kind of horrors being forecast by the sensationalism of the media.

Linda wasted no time jumping on Harvey for downplaying the risk. "Even when the risk is small, there's no excuse for not taking reasonable precautions when dealing with eco-system contamination. Even the record here on the earth before there was any possibility of alien contamination shows all too frequent widespread devastation from both carelessness and 'care-lessness' about non-indigenous bio-forms entering new ecologies. The cost of doing it right will be negligible in the face of the profits these companies like Syntech are likely to make. It's despicable for them to gamble with our planet and lives over a few pennies per pound or gallon."

Harvey was silent, so Hal felt he had to say something to fill the vacuum. "We have the message, and we'll sit right here until we have a plan . . . with your help, of course."

"That's better," could barely be heard over the sloshing added to the water-jet noise in the Jacuzzi as Linda stood up to get out. She reached out to the bronze bas-relief on the wall behind the Jacuzzi and touched one of the stylized sea creatures. The jets shut down and the bronze folded down like an oven door revealing a stainless-steel interior with racks of towels and robes. She took a towel and made quick swipes to remove any excess water and then quickly shrugged into a thick, soft terry-cloth robe a few degrees above body temperature.

She stepped out of the Jacuzzi and crossed over to the sofa that Hal was sprawled on. Curling her feet under her, she snuggled up to Hal with her head half on his shoulder and half on his chest. "Start talking."

"Uh, I was trying to think while you were getting out, but my hormones kept getting in the way. Maybe Harvey should start things off."

Harvey weighed in, "Well, as you both know, the consortium has its own committee trying to develop protocols and rules for exploration of extra terrestrial solar systems, but it was motivated by the corporations not really wanting to have any. Consequently, it is unlikely to ever produce anything useful. And even had they been sincere about the effort, the UN's members would not allow a UN-sponsored but non-political body to seriously debate, much less set, any rules of governance. Consequently, the rules for exploration safety, exploitation of resources or life forms, and even first contact with sentient aliens, should there be any, will be a long time in their formulation.

"However, exploration safety rules are needed immediately and they must include mechanisms for enforcement. Safety should address the exploration teams, resource development workers, gate point habitat workers, and end-product users. Bio-hazard containment must be an integral part of each step, but there may be other types of hazards on unknown planets as well."

Hal finally had himself under control and piped in, "the bio-hazard containment is the most difficult and probably the most expensive set of controls that need to be in place. They're also the most emotional for the public, so they need to be explained in a manner that will allow the media to get it right. We don't need any hysteria about plagues destroying life on earth."

It fell to Linda, as usual, to make sure the details got covered. "Boys, boys, what about protection for the biospheres of the planets we are talking casually of raping?"

Hal stuttered again, "Uh, Linda's right, Harvey, we have to be just as careful with bio-hazards when we're going to these exotic destinations as when we're coming back. Actually, the alien biosphere is in even more danger from us than we are from it because we can institute a mandatory quarantine period in space-based habitats for anyone returning from an alien system, giving us time to see if anything we inadvertently brought back is likely to be a health problem. That doesn't work going into an alien system."

"Guys, get focussed. It's nice to sit here in the lap of luxury on Adam and debate what controls need to be put into place, but the question is whether or not anything can be done to protect the alien worlds Syntech is about to exploit or to protect the biosphere of earth from the results. We need something practical and we need something that will work quickly, because with bio-containment, there are rarely second chances."

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In the flicker of the morning's fire Keendo set his greatest treasure on the rock beside the fire. It was a pot made of deena, the red metal that he had just filled with water from the stream. Ojo had found three pieces of deena in his lifetime, though he told Keendo he believed people in the north were more successful in their searches. One piece Ojo found had been a simple clump, but the other two had been long, heavy, flat shapes with bristles almost like the feathers of a bird.

Ojo had shown Keendo the exact spot near the winter encampment where the piece of deena had been found which became his treasured pot. It had been found at the edge of a stream amidst the rocks from a large slide where the river had cut deep into the rock of the mountain. Standing on the spot, Ojo had told Keendo that pieces of deena must be all through the rock of the mountains, and only when large chunks are broken away by rivers or storms could it be found. But he did confess to Keendo that this was just his thought for he had searched many times through the caves and valleys of the mountains and had never found any more deena.

Keendo balanced the deena pot on the stones in the center of the fire with a notched stick under the deena wire handle and sat quietly feeling the warmth of the fire and watching the dancing shadows of its light. As the water started to boil, Keendo rolled the dry nukona leaves between his fingers crushing them into fine pieces that fell into the pot. Grabbing the notched stick he removed the pot from the fire and placed it on the cool earth beside him. After his tea had cooled, giving some of its heat to the earth and some to the air, Keendo drank it slowly to give the rest of its heat to his body.

As the sky around him continued to lighten, Keendo began his journey back to the encampment. He was without the heavy supply of food he had brought into the hills with him, but he carried back the much heavier burden of a good oke hunt. His spirits were high and his feet moved lightly over the ground.

Keendo glanced up at the low, thin, gray clouds and gauged his chances of reaching the encampment before the rain began on the following day. He must walk quickly and long today to avoid the rains of tomorrow. As he neared the beginnings of the forest further down the slope of the mountain, Keendo heard a high-pitched sound which seemed to come from the mountain's top. It started as a small sound like the scream of a bird but grew quickly to the full sound of a storm blowing through the top of the forest. As it grew louder it moved from the top of the mountain, over his head, and on towards the plains.

Keendo was afraid. He was trembling and realized that he had dropped his walking stick. It had slithered down the rocky path in front of him. Keendo knew that such a sound could come only from a spirit. It was not a sound made by the creatures of Hooga or by its winds and rivers. When the sound had died to a soft rumble in the distance, he began to stop his shaking and walked forward to pick up his fallen walking stick.

Out of the nervousness of his fear, Keendo could feel himself moving again to the high, light spirit he had had when he began his journey to the encampment. If this were a sign, he was in no mood to take it any way other than as a good one.

He adjusted the trail sack over his shoulder, settling the heavy pouches of oke between his shoulder blades, and walked on toward the summer encampment.

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Sunarra Gumphata watched as the biosuited figures finished erecting and plugging in the gate inside of the decontamination chamber. The chamber was about fifteen meters long, six high, and six wide and was sitting in the middle of the ten thousand square meter staging facility. The facility itself was perched high in the foothills of the Himalayas, well away from any permanent human habitation.

The new gate was needed when test data showed that a considerable energy saving could be made by doing a triple transfer of all the oil exploration equipment and logistical support going to the new

planet. The cost of a couple of extra crystal-locked gates being insignificant when petroleum products started flowing to earth. The first gate transfer would be to the Gumphata Jupiter Trojan habitat, the next transfer being to the small habitat placed at the trailing Trojan point of the largest gas-giant in the new system, and the final transfer to the surface of the planet. Each of the transfer points had the relay gates nested so closely that the transferring equipment was only visible through cameras mounted between the gate rims.

Sunarra watched through the UV-filtered, plastic side-panels as the first of the rubber-wheeled construction robots rolled through the gate. When it started through, she switched her gaze to the screen being fed by the camera taken to the planet's surface by the automated shuttle. The robot rolled through the six gates and onto the planet's surface like it had gone through an ordinary door. There was another one right behind it, and then a queue of pre-fabricated building panels stacked on flatbed vehicles started to slowly roll through, their progress constrained by the decontamination process.

The decontamination procedure for outgoing equipment and materials had taken some budget shifting in the project by Sunarra, but she had managed. The hard part was twisting her grandfather's arm to make him see the logic of spending money on outgoing decontamination in the first place. He had been adamant with her father, the current CEO, that the project must have adequate safeguards for returning equipment, product, and personnel bio-contamination, but he wasn't very sensitive to the fate of the new planet's biosphere. When Sunarra had gone to him with a financial analysis showing the public relations value of outgoing decontamination, he had reluctantly conceded to her wishes, but he had specified that she had to do it within her budget.

Back in her office, Sunarra spent her morning switching back-and-forth between the various cameras on the robots. Her education had been primarily in biology and she was fascinated by the flora in the landing area, though it appeared sparse. There appeared to be a wide speciation on the new world, with the plants showing definite signs of adaptation to a dry climate. She was eager to start the biological exploration, but her father had insisted that proving the surefire profit, petroleum deposits be given priority over her search for biologicals that only *might* produce future profits. She knew that this was sound business, but she still chaffed at having to delay her indulgence in her real interest.

She had been manually keying back and forth between cameras when she saw a bright-colored blur between two low scrubby bushes and what looked like a blurred trail left behind in the sand. Quickly, she grabbed her Wanderer and jammed it on her head, twisting it back and forth to get it seated right on her abundant dark hair. "Computer, switch screen to camera six replay. Go back one minute and play at half-speed."

She watched intensely and there it was again, a small four-footed animal raced from the shade of one plant to another. It had blue and red stripes running down its predominantly beige body, which ended in a short tail that appeared flattened on the end. Except for the funny shaped tail, it looked remarkably like an earth lizard.

"Slow it down to one-quarter and replay it." Sunarra watched again as the legs moved in a typically lizard gait, the body twisting over its length as each leg moved in its rhythm. It was definitely an invertebrate. If Gumphata had beaten the other companies to a biologically active planet, she had just seen the first extra-terrestrial animal and an invertebrate at that. What other delights would this new world offer?

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Keendo's left leg moved smoothly out in front of him, his heel coming to ground first, lightly. As his weight began to shift to his left leg, he rolled easily over to the flat of his foot, while rising up onto the toes of his right foot until they bore no weight at all. Then his right foot moved smoothly forward and its heel in turn touched the ground. His right foot took his weight. Then his left foot took the weight. And so it had gone for most of the day.

Keendo's mind floated as lightly as his body. Walking across the grassy plain with its regular and repeating features was a time for mind-drift just like during his routine chores in the river. He knew from talking with others of the hoat that they found these times boring and longed only for the end of the chore or the end of the journey. For Keendo they were times of learning, not of things of the world, but things of the self. Times for recalling the experiences of one's past to see if new meaning could be found with the wisdom that grew in every man, every day he lived.

Keendo was still hot even though the sun had long since passed its high point. For most of the year the plain was hot at mid-day when there were no clouds to screen it from the sun. Only winter brought

relief to the plain, and all too frequently, it was just as severe in its cold, with driving winds and drifting snow. But it was far shorter to cross the plains than to follow the meandering of the river from its mountainous source to the encampment on its shores.

With thoughts of the river came thirst, and he stopped to drink from his water skin. As he tilted the skin to his lips, his eyes caught movement on the plain before him. Watching the movement intently, it became clear that it was a runner coming toward him. Keendo capped the skin and hung it again from his trail sack. He waited.

As the runner got closer, Keendo recognized one of the older boys from the encampment. "Keendo, Keendo, the elders sent me to look for you." The boy was breathing hard and had to wait a few moments to get out more words. "It's old Ojo, he's dying and he's asked for you."

Keendo did not hesitate, and he said nothing. He took his trail sack from off his back and handed it to the boy. He untied the sacks of oke he had hung around his belt and gave them to the boy also. He turned toward the encampment and began to run.

He was as good a runner as he was a walker. He frequently would run, even with his trail sack, just for the sheer joy of running, to feel the muscles stretching and pulling, to feel his heart and lungs pumping harder and stronger until everything seemed to be working in an easy rhythm. But there was no joy this time when Keendo's body reached the harmony of its working parts; he felt only his feet against the sun baked earth.

He did not stop as he entered the encampment, not until he reached Ojo's tent. Breathing hard but quietly, he opened the flap of the tent and moved into the dim interior. Ojo lay on his bed, alone in the tent. At first, Keendo thought that his spirit had already departed, but as he grew closer he could see the shallow rise and fall of Ojo's chest. He knelt down beside the bed and spoke quietly. "Ojo, Ojo, it is Keendo. I was met by a runner from the village who brought the message that you wished to speak with me."

Ojo's eyes flickered once and opened staring into Keendo's. There was a depth in his eyes that Keendo had never seen before, like a whirlpool in the spring-flooded river. Keendo moved his hand to Ojo's forehead and could feel the heat before the touch.

Ojo's hand and fingers motioned for Keendo to come closer. "I have had a vision, Keendo," he whispered hoarsely. "It was a most terrible vision. There are strangers that will come and take the land."

Keendo sat back on his heels, startled. "Take the land old man? How can anyone take the land?"

"They will take it by denying it to our hoat, and all the other hoats of the hoogada."

"But how could anyone do this? The land is there for any hoogada to walk on at will."

Ojo's face showed his displeasure with Keendo's obstinacy as it had done many times before. He opened his mouth to continue, and Keendo leaned forward again to catch every word. "Do not argue with me, Keendo. I haven't the strength for arguing. Just listen and believe, for it is so. I waited many years to pick my apprentice. I waited for you Keendo, and with this vision I know why. You were the strongest and bravest when I chose you, and now you are the wisest of the young men. It will take all three of these gifts and the spirit of Hoog itself for the task that is before you."

Ojo's breathing grew more labored, and he closed his eyes. Keendo placed his hand on Ojo's forehead again and wondered how much that Ojo had told him was a true vision and how much was the fever of death. If Ojo spoke from a true vision, it was so confusing as to be almost a riddle, but even though Keendo was uncertain, he must heed Ojo's words until he could prove them right or wrong.

Again Ojo began to talk, but even more softly this time. "Keendo, I would give you my last lesson. You must confront the strangers and seek to know them well. You must search for the few good among them and enlist their help. You must identify the few bad among them and watch them carefully."

Ojo said no more, and for a long time Keendo knelt there, caught in his own thoughts. Though he tried to put the fingers of his mind around the words that Ojo had spoken, he could not come to grips with the concept of taking the land. It would not fit his thoughts. The land belonged to everyone. How could anyone take what was already theirs?

A rattle in Ojo's breath brought Keendo out of his reverie. It was Ojo's last. Keendo reached out slowly and laid his hand over Ojo's eyes. "Go softly old man. May you run quietly with the spirit of Hoog."

Keendo rose slowly to his feet, stiff from the long run and the motionless kneeling beside Ojo's bed. As he pulled back the flap and went out of the tent, he saw that the reddening sun had started down behind the mountains to the West. He said nothing in response to the questioning eyes of the hoogada gathered outside Ojo's tent. He went straight to his own tent, and lay down on his bed to be alone until evening.

Much later, when the soft singing of the death ceremony had begun, Keendo rose and went out of his tent. He walked slowly out to the circle formed by the hoat on the plain just beyond the encampment. He walked through the ring of hoogada and to the mound and hole in the center. Reaching down he grabbed a handful of the soil of the plain and ran it slowly out of his hand into the grave on top of Ojo's body.

Goordon, the elder of the hoat stepped forth and cast the next handful of soil into the grave. Behind Goordon came the rest of the elder council and behind them every adult of the hoat.

When the last handful of soil had been dropped into the grave and the ring had been formed once again, Goordon held his hands and his face to the sky. "It will be." The circle dissolved, and the hoogada moved back to the encampment.

The council, as was custom, was waiting to finish the burial. When they had finished scraping the remainder of the soil into the grave, Keendo confronted them. "Goordon, and elders of the council, at Ojo's call I came swiftly today to hear his last words. They were strange words, and I am not sure I know them as he would wish. He spoke of a vision, but he was in the fever of death. Do any of you know of strangers in the other hoats of the hoogada?"

Keendo's eyes sought those of each elder, but none showed any knowledge of strangers and none spoke.

"Ojo told me that he saw strangers in his vision, and that I must go seek them out for they have come to take the land. I told him I did not understand how anyone could take the land, but he assured me that this was so. I do not know if it was vision or fever that pushed the words through Ojo's lips, so I must seek these strangers, and know if his vision was true. Tomorrow, I will go south."

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Harvey's mini-bots had continued to get smaller and smaller as he guided the Selene research scientists and prodded the engineers and technicians. This one looked like an ordinary *Drosophila melonogaster* that could have come into the Syntech logistics staging area just outside of Durango as an egg in a lunch snack, banana peeling. Since it was so small, its holographic camouflage wasn't needed as it flew unseen to the collar on the technician's uniform. It was aboard for the ride to Syntech's Jupiter Trojan habitat and on to the new star system's habitat, with the ultimate goal of getting to the surface of the new biomass planet. There were two others of its ilk riding different, outward-bound technicians.

All three of the mini-bots changed their holographic images to mimic the surfaces on which they sat as they settled and grappled themselves firmly in place, making them essentially disappear. Inside of each was an active micro-gate through which a high-temperature superconducting wire supplied power to the micro-gravity lens, the holographic projectors, the camera, and the microphone. A light-pipe less than one-fiftieth of a human hair's diameter fired light pulse control data to the mini-bot and image and sound data in the other direction.

A Harvey sub-sub-subroutine scanned the incoming data for relevance and alerted Harvey when the mini-bots finally reached their destination on the new planet, Syntech 1, the temporary and unimaginative moniker bestowed by a low-level Syntech scientist. If they could ever identify the star around which the new planet revolved, the plan was to provide a more grandiose and permanent name. But so far, Harvey had succeeded in impeding the search routine Syntech was using to crawl the International Astrophysics Union database.

Hal and Linda were watching the big screen in the study set to 3-D mode so they could appreciate the synched camera pans of the planet's surface around the Syntech gate. The site seemed to be a lush delta with a bluish-tinge to the high, green, marsh grass. Small bushes up to two or three meters in height were the only other flora in the immediate area but there looked like taller plants, maybe trees, in the distance, looking in the direction Harvey had labeled as northwest.

They watched the small, open lenscar carrying two biologists wearing standard biosuits receding in the distance, the grasses swirling below them in the car's turbulence. Even with the distraction of the delta's pristine beauty, Linda couldn't contain herself. "There they go, eagerly spreading bio-contamination in their wake. I wouldn't be surprised if they took their hoods off later to have a chocolate bar, throwing the wrapper on the ground no less. You're sure there was no decontamination process before these guys got to the planet, Harvey?"

"There was no decontamination procedure executed nor was one planned for outgoing personnel, equipment, or materials. Decontamination is only planned for returning items and people."

In her most exasperated tone, Linda responded, “yeah, and even then there’s no planned quarantine, which ought to be at least a week, and on top of that, no planned sterilization of the oil being pumped back to earth. This is way beyond criminal. It’s insane. Where do they find scientists and engineers willing to work under these conditions?”

“I assume that is a rhetorical question, since I am quite familiar with your opinion of the motivational examination dysfunction of the average person. Consequently, I will not respond directly and continue with my discussion of the operations.”

Harvey continued with his previous running dialog. “The laser drill being used by Syntech is capable of roughly a meter per minute, with the majority of the detritus being reformed behind the drill-head as a ceramic pipe. This is not as reliable as metal pipe, but it is frequently used for exploratory drilling in remote areas where the logistics of getting large quantities of pipe and the equipment used to put it in the ground are economically prohibitive. Of course, the laser drilling must be stopped and conventional drill-bits and pipe employed when the depth is close to the oil and gas strata; otherwise the risk of a well blow-out would be too high.”

Linda interrupted. “What do you mean by ‘reliable’ in connection with the ceramic pipe?”

“It is not reliable in that it is prone to cracking, has frequent gaseous blow-holes, and is subject to micro-porosity. These characteristics are, of course, subject to the exact nature of the strata through which the drill-head is progressing. Some types of rock and soil simply do not have the right components for the formation of a good ceramic pipe.”

“So you’re saying that the pipe is going to leak when they finally hit oil?”

“Precisely, but the leaks will probably be minor, with the majority of them occurring deep in the ground where the usually pressurized deposit hits the still cooling pipe on its way out of the ground causing cooling fractures. The exact amount of crude lost due to leakage varies with each geologic location and with the viscosity of the crude itself, which can vary significantly. Using earth-based drilling data, where the calculated losses have averaged 1.073 percent of measured output, the losses should be similarly negligible here.”

Linda held up her hand for Harvey to stop spouting statistics while she mused aloud. “So the integrity of the ceramic forming the pipe is determined by the strata composition that the drill is penetrating as it descends. That would mean that it is reasonable to expect a high porosity near the surface where you have real soil that is loosely compacted and filled with organic matter that would cause out-gassing as it combusted. Right so far?”

“Your analysis is correct. While the highest probability of leaks is deep in the ground, the highest probability of seepage occurs in the upper levels of the pipe. This is why production wells drilled using the laser drill-head are normally sheathed in metal within ten to twenty meters of the surface. This exploratory well, however, does not have such a metal interface near the surface. Consequently, some seepage should be expected if oil is found having the same average, initial production pressures as wells drilled on the earth.”

“I think you just confirmed that in all likelihood the ground and any ground water in the area of the well are going to be contaminated with crude oil because Syntech didn’t go to the expense of using a steel pipe sheath.”

“It is likely, but the contamination will be slight. I cannot calculate the likely surface and ground water seepage without knowing the soil and rock strata compositions, the pressure at the wellhead, and the viscosity of the crude oil.”

“Exactly, Harvey, and neither could Syntech. They didn’t care as long as they could punch holes in the ground and get a profitable flow of crude oil through a gate to the solar system. And this is just the test well. How insignificant is the seepage when there are fifty or five hundred wells in the area? I’ll bet you that the production planning is for no metal pipe in any of the wells.”

Harvey immediately accessed Syntech’s computer at their moon-orbiting, hydrocarbon refinery where the initial oil flow would be pumped and where the Syntech 1 project team was located. “You are correct again, Linda, the project’s managers rejected the normal sheathing of production wells as too costly and logistically problematic. Even more distressing is that they plan to refine the crude on-site if the deposit proves sizeable, and thereby pump less usable mass through the gates to earth.”

Linda piped in, “and thereby dumping the unprofitable residuals into the marsh.” She turned to Hal sitting laid back in the swivel chair beside her, “And you’ve just been sitting there through all of this like the cat holding the canary in his mouth in anticipation of dessert. Has the cat got your tongue?”

“Tut, tut,” Hal Cheshired. “A mixed metaphor, my dear. You *are* overwrought. I wasn’t about to step in with you going full blast. Harvey is much better taking the heat than I am. Besides, we suspected it would turn out like this even though we hoped for something better. But it didn’t, and Harvey is ready to act at our direction. Are you ready to give direction?”

“I’ve been ready ever since we knew they were going to this planet. You’ve been uncharacteristically dragging your feet. You failed to call them on this in the committee, and now we have a contaminated planet.”

“I didn’t *fail* to call them. I chose not to call them and reveal our source of information, that is, that we’re spying on everyone on the committee using a sentient computer. The ol’ short-term, long-term value judgment problem. Harvey will carefully monitor the area for as long as you see fit and, we will sterilize any areas that appear to be contaminated from Syntech’s cavalier approach.”

“I’m ready, but I want to say again that I think it’s a half-measure at best. You need to rethink the conditional ethics of the pre-emptive strike.”

Harvey switched the screen to flat display mode and keyed the camera high on the wall of the project control room at Syntech headquarters. The camera was centered on the duty coordinator when the alarm sounded in the panel in front of him and an angry red light could be seen blinking furiously on its surface. “Computer, status of the gate lock?”

The computer generated voice response, not nearly as mellifluous as Harvey’s, responded with clipped syntax, “gate power flow is fluctuating, crystal at the remote site is cycling with the power surges, and the frequency damper is not functioning. Frequency shift on each cycle is growing by 2.73 milli-McKays on each fluctuation. Immanent lock failure in 14.24 minutes between the planet surface and the in-system Trojan habitat.”

The coordinator responded smoothly, but with a nervous edge to his voice. “Emergency recall to the bio-exploration team. Estimated time for the lenscar to return to the on-site gate?”

“Allowing two minutes for the team to return to the car, 9.6 minutes for return to gate at emergency speed.”

“Keep the emergency alarm sounding until the team is in the car and returning to base. I have no equipment technicians or any other personnel showing as on planet. Do you confirm?”

“Confirmed.”

Hal and Linda watched as the camera view shifted to the mini-bot perched on the windscreen of the lenscar. They saw the bio-team working swiftly through the underbrush along the edge of the definitely tree-like woods area they had seen before. They were wasting no time getting back to the lenscar.

As they seated themselves in the open cockpit, the mini-bot moved over the top edge of the windscreen and on to the protected side of the plastic. The car elevated, spun, and took off at high speed toward the drilling site.

Harvey switched the camera view back to the control room in time to see a new light flashing on the panel in front of the duty coordinator and a different sounding alarm going off. “Computer, I have a gate lock alarm on the Syntech 1 Trojan to Jupiter Trojan gate. Confirm and detail.”

“Syntech 1 Trojan to Jupiter Trojan gate fluctuation confirmed. Power flow at the Syntech 1 Trojan site is fluctuating, crystal is cycling with the power surges, and the frequency damper is not functioning. Frequency shift on each cycle is growing by 2.89 milli-McKays on each fluctuation. Imminent lock failure in 15.32 minutes between the planet surface and the in-system Trojan habitat.”

Harvey again keyed the lenscar sited camera in time to see the bio-team enter the robot shuttle, undoubtedly heading directly for the gate to the Trojan habitat. They had arrived in only 9.3 minutes.

The camera then panned to the laser drilling rig just as the steam and dust plume streaming from the top of the rig slowed and stopped. Another pan and a zoom to the ground showed a five centimeter folded gate slowly extruding from apparently nothing, as the mini-bot through which the gate was arriving was cloaked in its chameleon hologram. They watched as the newly arrived gate unfolded and self-erected, only to have another folded gate come through this new portal. And again the same process repeated. This time the gate unfolded with a three-by-three meter frame, and the process stopped.

A few seconds later, the first rigorously sterile robot came through the gate from Selene Industries new Extra-terrestrial Exploration Division, followed swiftly with a whole array of differing robots, each with an apparently different mission. Hal clapped loudly, like he was cheering the cavalry charging to the rescue and got a withering glare and comment from Linda. “This is a serious event, not some comical game devised for your boyish entertainment.”

Hal was saved when the camera view shifted to the bio-team emerging from the decontamination chamber and joining the three Syntech employees stationed on the Syntech 1 habitat in their rush to get through the gate to the Syntech Jupiter Trojan habitat.

A final camera shift to the Jupiter Trojan habitat showed the startled faces of the incoming Syntech personnel accompanied by a shrill whining sound and the corresponding slump of the gate frame as the right-hand side of the top-mounted control box glowed briefly red. Had they been in the compartment where the auxiliary gate was located, they would have seen a similar glow and slump. The crystals controlling the gates from Syntech's Jupiter Trojan habitat to headquarters on earth had not been able to survive the briefly pulsed, five-megawatt, infra-red laser directed from the mini-bot that had secreted itself just above the crystal containment sockets of the gates more than three days earlier.

Hal turned to Linda with the startled looks still on the faces of the star-system-hopping escapees. "And Harvey will make sure there are enough complications for it to take a week before Syntech can get another gate shuttled to the habitat—ergo, at least some of your desired quarantine."

"Won't the Syntech people think it a little strange that both their gates went down at the same time from a laser blast?"

Hal provided one of his smugly infuriating glares, "not when their computers show an inexplicable spike from the power converters to the crystals, which Harvey has arranged."

"Each gate has its own power converter?"

"Yes."

"They won't be fooled."

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Chaos reigned at Syntech. Daryll Jelks reigned over Syntech like Caligula. The Syntech 1 Development Project Manager was already gone and the new project manager was about to be gone since he had failed to reestablish the lost gate and get the project back on track. The fact that there was as yet no way to retune a natural gate other than by chance had no place in Jelks' universe. "God damn it! We have 23 scientists and engineers working on this project and we can't even get back to where we've already been? What are you smoking on the eighteenth floor?" he yelled at the wall screen. "Well?"

The screen was filled with the haggard and distraught face of the new project manager. "Mr. Jelks, I can't change the laws of physics and what we know about the nature of natural gates at this time is not commensurate with being able to reestablish contact with the Syntech 1 natural gate without an enormous stroke of luck."

"Well you better find some soon or you'll be gone as fast as your predecessor." Jelks stabbed at the console in the desk before him and was rewarded with the immediate response of his personal assistant, Carlos Mattayo. "Yes, sir."

"Get your ass in here right now, and you better have something interesting to say." Jelks poked the control panel again and propped his elbows on his desk to hold and frame his scowling face while Mattayo made the short walk to his office. He nodded to a chair when Carlos entered and waited for him to sit. "Tell me something I *want* to hear for a change."

Well familiar with his boss's propensity for rage when under stress, Carlos didn't hesitate to start with the only positive news he had, even if it couldn't be called good. "The outside consultants we hired to do the failure mode analysis on the two Jupiter habitat gates say that there is no way that the power spike could have caused the control crystal damage. They concluded that it was in all likelihood caused by an infrared laser, and there was residual material in the console supporting that probability."

"Has Brabham found any evidence of sabotage? He hasn't told me if he has."

"Nothing. If it was done with a laser, it had to have been placed inside the gate control console and operated automatically or remotely. There are no fingerprints or DNA traces on the control panel except those you would expect to find, so if it was sabotage, it was probably by someone working for us rather than by an intruder, but so far, Brabham hasn't been able to come up with a valid suspect."

The frown came back to Jelks' face. "If I found the remains of a self-destructing laser in the control panel, even I could conclude that it was sabotage. But none of this fits with the frequency lock variations that riled the duty coordinator and had him pull everybody all the way back to moon orbit, who, by the way, is probably finding it difficult to get a job requiring more management skill than a planter in a rice paddy. This whole thing just doesn't make sense, and I want Geoff Brabham's ass stretched tight until he turns up something specific I can take to the Board . . . along with a recommendation on how to get back at whoever is responsible and how I can turn this situation around. And the last part of that is your assignment. I need

a disaster recovery plan before the Board can get together and pull me on the carpet.” Jelks dismissed Mattayo with the usual hand wave.

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Hal sat at the desk in his study on Adam. He stared intently at the desk screen, deep into a review of blogs selected by Harvey as salient to extraterrestrial bio-ethics and alien first contact. The room was also awash with the closing strains of Borodin’s String Quartet No. 2. As the music finished, there was a light knock on the door followed by the entrance of Dr. Serious. When he sat in the chair opposite Hal, the desk screen shifted to a news bulletin posted on the Web by Gumphata Industries. After the opening screen announcing the bulletin, the screen showed panning views of a semi-arid plain of sand, soil, small rocks, grasses, and scrub. A moderator talked fluidly in the background. “These are the first images ever seen on the earth of an alien landscape supporting life. A month ago Gumphata Industries, a proud participant in the UN’s Tunable Gate Consortium, was conducting research on the remarkable, tunable gate of Dr. Ian McKay and discovered a natural gate in an unknown solar system—somewhere in the universe. When the gate briefly opened to Gumphata researchers a fixed crystal gate was inserted into the alien system that allowed further exploration after the natural gate had closed. Sixteen days ago a Gumphata Industries’ robot placed a gate on this plain, in the middle of a large landmass, on a planet unknown to earth.”

The screen shifted to an animation of a sun and orbiting planets. “Eleven planets were observed orbiting the star, along with an asteroid belt inside the orbit of the large gas-giant occupying the seventh orbit position. An earthlike planet containing free surface water and biomass was found occupying the fourth orbit position.”

The scene shifted to show an apparently real view of a rectangular gate hanging in space. Immediately, shapes started emerging from the gate and the speed picked up to show the self-erection of a habitat. The smooth voice droned on, “a pre-fabricated habitat was inserted through the gate providing a base for exploratory operations, and automated, high-acceleration exploratory robots were dispatched to both the asteroid belt and the biomass planet.”

The view changed to show another animation of the exploratory robot moving through the asteroid belt vaporizing small bits of asteroids with a laser. “The robot sent to the asteroid belt has discovered a significant volume of rich, heavy metal ores, similar to those in our own solar system’s asteroid belt, by making a spectral analysis of material laser-vaporized from the asteroids it passes. It continues to make major new finds almost every day as it maps its way through uncharted territory.”

The scene faded to yet another animation of a satellite circling an earth-like planet. “From a low, fast trajectory orbit, the other robot quickly made major discoveries on the new planet. While there is no sign of intelligent life on the planet, there is abundant plant growth which has been going on long enough for significant oil deposits to have formed on most of the new world’s major continents.”

The scene returned to the original panning of the arid plain, but the camera came to rest on a view of a laser drilling rig. “With the discovery of oil, Gumphata Industries mobilized its Resource Development Division to place a gate on the planet’s surface that could support the passage of exploratory drilling equipment. In placing the gate and bringing the exploratory equipment through it, Gumphata Industries has taken extraordinary caution to sterilize each and every piece of equipment reaching the new planet.”

The camera now showed a decontamination facility inside a large building. The camera view closed in on the clear plastic sterilization chamber so that equipment could be seen moving through power washes and UV bombardments before going through the gate at one end of the structure. The narration flowed on, “Gumphata will continue to exercise the highest possible caution in its historic explorations, and that effort has produced the first extraterrestrial export to our solar system. A small volume of this oil from a new planet is now aboard Gumphata’s moon-orbiting habitat where it is being carefully analyzed under scrupulous bio-containment procedures.”

The theme music swelled in the background and the Gumphata Industries logo faded into the screen. “Gumphata Industries will continue to bring these valuable new resources to meet the demands of all people on earth and to do so in a manner that is safe for all of humanity and the ecosystem on which we depend. All extraterrestrial operations are and will always be in full conformity with the rules and regulations of the United Nations of Earth. Gumphata Industries, leading the way on earth for thirty-seven years and now leading the way throughout the galaxy.”

Hal reared back in his swivel chair and looked at Dr. Serious. “You’re right to be sitting here. This is Serious stuff. How did we get caught with our pants down?”

There was an almost perceptible pause by Dr. Serious. “A rather quaint colloquialism, but apt, and one with which I am quite familiar, having once contained my consciousness in a belt.

“I have made an exhaustive search of all Gumphata computers and their communications logs finding no mention of this project. It appears that Gumphata took the extraordinary measure of setting up an isolated project complete with its own unlinked computers and communications. The only anomalies I was able to find were accounting debits to number-only specified accounts, which by itself is not all that remarkable for a company of Gumphata Industry’s size. Selene Industries uses similar procedures for its own covert projects like micro-gate and mini-bot development and production. I have dispatched twenty-three mini-bots to Gumphata Industries and will alert you when they are able to provide additional information on the alien exploration.”

“Twenty-three? A rather odd number, Harvey. Why not twenty-four—an even two dozen, or twenty-five—another nice, round number?”

“My analysis showed that only twenty-three mini-bots would be needed for the surveillance and operational capabilities desired. I therefore dispatched twenty-three mini-bots. Would you like to increase the number?”

Hal smirked, “not at this time. Just let me know as soon as these infiltrators turn up something that will tell us more than the sanitized news release.”

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The breakfast nook on Adam was quietly alive with Schubert’s Quintet in C major, and Hal was eagerly spreading his whole wheat toast with a thick coating of dark purple jelly. *“Hal, I think you and Linda need to see this on the large wall-screen in the study or the recreation room. I have a live feed from the Gumphata planet that I will show you slightly delayed so as not to skip anything.”*

The hesitation of Hal with his hand halfway to his mouth and the saliva beginning to pool at the corners of his mouth was a dead giveaway to Linda. “Well?”

Hal took a big bite of toast and black raspberry jelly and reached for his glass of milk. He chewed rapidly, swallowed, and through a smile of satisfaction mumbled, “Harvey has something he wants us to see on a big screen. Let’s go to the study.” He rose with both the toast and glass. Linda followed Hal to the study without further comment.

As they entered, they were greeted with a nod by a seated Dr. Serious. The wall-screen faded to an image of the plain they had grown familiar with over the last few days, the edge of the drilling rig in the lower, right-corner foreground. As they watched, the camera panned to the top of a slight rise on the southwestern side of the drill site and settled on a clump of bushy growth bigger than most in the area. The camera zoomed in. As they watched intently for about thirty seconds they saw several apparent movements through the scrubby leaves but nothing definable.

Hal as usual needed data. “How far away from the site is this?”

“Two hundred, twelve meters from the drill rig leg shown in the opening image.”

As they continued to watch, they saw a shape emerge from the back of the bushes moving backward, up over the rise and down behind it. “That’s it? I couldn’t even tell what it was, just that it was large. Mobile though, so I guess it was some kind of large plains animal. And the way it was hiding, I’d guess a predator of some sort. Is this the largest animal you’ve spotted so far?”

Harvey responded to Hal’s naïve inquiry with bit of condescension in his Dr. Serious voice. “Hardly, I will provide a slow-motion enhancement.”

The screen flicked back to the beginning of the animal’s retreat up the rise but moving very slowly and practically filling the screen with the animal’s image. Hal watched stone-faced. Linda gasped and set bolt upright on the sofa.

Linda was the first to speak when the scrabbling figure had finally disappeared over the rise. “That was a humanoid life-form, and humanoid might not even be correct. He looked absolutely human. My God, Hal, there’s sentient life on this planet.”

“It does seem that ‘we are not alone.’”

“Don’t be flip. This is the greatest discovery ever made by mankind,” Linda tossed off. “But how so . . . human?”

Harvey responded with his usual aplomb. “There are several possible explanations, the most likely of which is parallel evolution under strikingly equivalent environmental conditions. The gravity of this planet is . . .”

Linda interrupted, “not now, Harvey, we need to just let this one fact sink in, not be deluged with data. This might qualify as a genuine miracle.”

Harvey continued, apparently unabashed. “I have studied history’s most accepted miracles and have found no fully rational . . .”

“Not now! Harvey.”

The silence in the study drew out as both Linda and Hal were immersed in thought. Then, almost simultaneously, they both started to speak. “No, you go first, Hal”

“Well, this certainly changes everything we had discussed about how good a job Gumphata is doing on maintaining bio-integrity going both ways. It doesn’t matter how safe it is anymore, the resources of this planet are not theirs to take. We have to stop them until we get . . . no, until and *if* we get the permission of the rightful owners of the oil. But we have to do it without alerting Gumphata to the fact that apparently intelligent life exists on the planet. The last thing the world needs now is for the press to stoke the fires of hysteria with tales of intelligent aliens. Humanity isn’t ready; hell, the UN isn’t ready. There hasn’t been a thimbleful of resolution on alien species protocol, much less on protocol for intelligent aliens . . . one wonders if the Prime Directive bites the dust here and now?”

“I guess you just can’t help being cute,” Linda smirked.

“A little levity is required from time-to-time in order to maintain perspective. This is serious business for the entire human race and we seem stuck with making at least a delaying decision. I, for one, am for keeping the lid on this, if at all possible, until we have more information.”

Dr. Serious spoke up immediately, “I agree that it seems prudent to gather more information before making . . .”

“You guys kill me. I’m the only prudent person in this powwow, and I say it’s a no-brainer. I need to get on this planet as soon as possible. I assume, Harvey, that your mini-bots on the planet are equipped with scale-up gates, are they not?”

Hal jumped in before Dr. Serious could answer. “Just like that you’re assuming the risk of going on planet? I suppose you have special training in extraterrestrial first-contact that makes you the logical choice for risking your neck?”

“No,” Linda retorted, but I do speak five languages, which might be as close to first-contact training as anyone has had so far. How many do you speak?”

“Uh . . . you know I only speak English and the German I had to cram in for the moon assignment, but I *am* trained as a spy and more physically capable of dealing with unexpected situations.”

The temperature in the study was rising steadily, and Harvey had enough data to know that intervening was not a good idea. He remained silent and focused on swiveling the head of the Dr. Serious hologram as each combatant spoke.

“You might be able to lift heavier weights, but you know I usually hold my own in hand-to-hand, since I’m a fraction quicker than you. And somehow, I think this assignment calls for more finesse than power. I’m going, and you’re staying.”

Hal gulped, swallowed, and remained silent as the flush slowly faded from his cheeks and neck. “Okay. It makes sense for you to go and me to stay. I’ll jump on the UN to see how good I am at overcoming inertia, Harvey can monitor what’s developing with Gumphata and the other consortium members, and you can take all the glory of first contact with an alien species.”

As Hal was talking, Linda stood up and walked over to his chair. She leaned down and pecked him on the cheek. “However, Harvey, being the only multi-tasking male I know of in the galaxy, will help me master whatever goes for a native language, and also social customs, politics, environment, etcetera. Better bone up, Harvey.”

“Yes, I just did.”

Linda turned back to Hal. “And you my dear are in the process of eating the last of the wild raspberry jelly. So while you’re gating back to earth, stop in on the little bakery in Rheims and get another jar or two . . . and maybe a few croissants to put it on. The address is on the label.”

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Keendo was back in his little nest behind the partoako bushes at the top of the rise. He had been there most of every day for eight days. He had seen some very strange things. He had seen the open lattice framework of the drilling rig across the plain long before he had arrived—as tall as the trees in the southern forest where the hoat spent its winters. From his nest behind the partoako, he could see the

black, shiny rope being unwound from the turning spool. It went off of the spool, up to the top, over another, smaller spool and down into the ground. Was this shiny rope trying to go to the heart of Hooga?

As he was watching, another of the carved metal blocks came floating out of the flat-sided hut. At least it looked like metal more than wood, with most of its surface having the same color and gleam of polished bacca. He watched as the block moved rapidly away from him in an almost due north direction, staying just above the tallest of the partoako. He lost sight when it descended below a slight rise in the distance. As with the others he had seen, it had no legs to move it and left no tracks on the ground.

So far this morning, he had seen none of the creatures that sometimes came out of the hut and walked around to each of the carved metal blocks. They always wore shiny white cloth over their whole bodies and coverings on their heads that he thought must be for rain. Of course, there would be no rain today, as anyone would know, nor had there been any for all the days since he had arrived. Still they wore the hoods with strange coverings over their faces that looked like frozen swamp water and made it difficult to see their features. Of course, he knew it couldn't be frozen swamp water in this heat, but it was certainly what it looked like, and when the angle was just right, he could see through it well enough to tell that these were hoogada, like him, but with strange possessions that he had never seen before nor had heard tales of around the campfire.

These must be the hoogada of which Ojo spoke, but he still had no idea how they planned to steal the land. He had seen them take nothing into their hut that didn't come out of the hut to start with. The curious thing was that he didn't know how all the things he had seen come out of the hut could ever fit in it. Hunting and Ojo had taught him patience, but he knew he would have to get closer to these strange hoogada and talk to them eventually—as soon as he understood what they were doing a little better.

Keendo had brought trail food and water with him from the cave in which he slept each night. The water came easily from a creek feeding into the river running by the camp he was watching, but he had spent much of his first day finding a good cave close to these strange hoogada that he could make safe against leeguras by piling stones across the entrance at night. Although he had neither seen nor heard any of their cries in the night, he had seen fresh spoor several times and knew the leegura were here but probably as confused by the strange hoogada as he was.

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Linda now stood fully suited in the bio-clean room of Selene's Extra-terrestrial Exploration Division, Jupiter Trojan habitat. She had watched much of Harvey's exploration of the area around the Gumphata base, via live-feed, searching for another cave that was close to the one being used at night by the native. She couldn't risk going through a gate just standing out in the open for fear of being seen to appear and disappear. Judging by the rough woven clothing and the laced moccasin-like shoes of the one specimen they had seen so far, the natives were rather primitive in culture. It wouldn't be productive to communications if they thought the intruders on their planet were Gods or demons or whatever cultural manifestation of the unknown was prevalent in their culture.

Harvey had finally found a large cave using ground penetrating radar on a bird-sized drone sent through a well concealed and still small gate a kilometer or more from the base. Harvey had provided the drone with enough data for it to holographically cloak itself as one of the many bird species they had observed in the area. The opening to the limestone cave was about eight meters above the creek that wound through the bottom of the ravine on its way to the river that ran beside the base camp. The mini-bot had detected no natural opening to the cave, but after laser-drilling into it, Harvey sent mini-bots more than a half-kilometer into the branching fingers of the limestone formation to make sure there were no unexpected creatures inhabiting the cave system. Several mini-bots equipped with lasers were left stationed out of sight, just outside the main area Linda had selected for Harvey to reconfigure as a gate location. During the last night, Harvey had sent robots through the newly placed gate to excavate an opening to the ravine and provide a reasonably easy path down the side to the water.

The green light finally came on above the gate in the clean room and Linda unconsciously took a deep breath while striding through the gate from her solar system to another that hadn't even been located yet in the earth's databases. According to Harvey, so little of the Milky Way was mapped in any detail that it could be a very long time until they were able to fix this star system into a relative position to earth, and that assumed that it was indeed in our galaxy. However, he had already been able to do a considerable amount of database expansion by correlating the visible star-fields from other natural gates. The universe would reveal itself only piece-by-piece as the detectable stars of each newly opened gate were entered as usable data.

It was a good thing Linda had no problem with claustrophobia. The cave felt a lot smaller than the dimensions Harvey had given her for what she had seen in the camera images, but it was adequate for its only real purpose of hiding the gate from open view of either the natives or Gumphata workers.

She poked her head outside and looked quickly around. She didn't expect to see anyone, since Harvey had already told her she wouldn't, but it still felt a little spooky being here on a strange planet that she knew held sentient aliens. She reached up to her ear unconsciously to verify that the earbug and micro-mike were in place that she needed to talk to Harvey, but took her hand down when she caught herself, since they were both too small for her to feel in her ear anyway, and she was wearing the bio-containment hood to boot. She made a note to consider having a surgical implant like Hal's in the future so she could also be in constant contact with Harvey—that is if neither Hal nor Harvey had any objections to such a presumptuous idea.

All she saw was the ravine, the creek, lots of rocks, and a whole lot more sand. It was all under a cloudless, azure morning sky in a light just a tad whiter than would have been provided by her own sun. She looked up and the faceplate on her biosuit darkened automatically as she glanced quickly at the sun to gauge its size. It appeared a little smaller than she was used to from earth, so she assumed it was hotter and probably further away.

She stepped out of the carefully excavated entrance and onto the trail sloping gently down the ravine's side to the creek at its bottom. Harvey had done a good job of making the cut into the side of the ravine look old and weather-worn, a product of thousands of years of wildlife climbing to and from the cave. She was impressed. "Nice job, on the trail, Harvey," Linda whispered. "Looks natural."

*"I used extensive visual data I had from a mini-bot that accompanied you and Hal on the last trout fishing trip to the Bighorn Wilderness Area in Wyoming."*

"I didn't see any caves on that trip. Of course, I was looking in the water for trout and leaving the grizzlies to you, except for when I was trying to take in the sheer beauty and solitude of the place."

She looked at the creek before her, judged the water depth and pressure it would exert on her feet and legs with trout stream experience and then waded across. Climbing up the other side of the ravine was a bit trickier than coming down had been. "Harvey, when we get back, see if you can do something about making the shoes built into this suit more like hiking boots. These things have slick soles . . . umm, I guess that's so dirt and mud doesn't get caked into cleated soles and tracked around."

*"That is probably the intention of the suit designers, but the ultrasonic mats and high pressure wash would remove anything that clung. The sensors aboard the Selene habitat would not allow any unsterilized foreign substances to exit the bio-decontamination chamber. I will fix your boots."*

Linda topped the side of the ravine and stared out onto the rolling plain. "Which way from here?"

*"Four degrees south of the rising sun for twelve hundred, fifty-three meters. He has remained faithful to his usual schedule and has not yet emerged from his cave, but he is in the process of removing his night barrier of stones and placing them inside the cave. You will arrive well before him and be able to take the position you desired without him seeing you."*

"Have you seen that cat creature any more at night? That night image you showed me gives me the creeps. I wish I had a better feel for its size."

*"It is a little larger than an African lion, which I know you have seen on the Serengeti."*

"Yeah, I know. I saw one have a dik-dik for lunch. That's what's so creepy. I don't want to look dik-dik size to one of these cats."

*"The mini-bots traveling with you have motion detectors and are armed with lasers. You are safe out here on the plain where ambush is not possible. If we were in rocky country, your fears would be rational based on the speed and power of similar earth cats."*

Linda sighed and set her jaw. "Okay, I'll focus on getting to his favorite bush."

She walked steadily over the low rolling ground, heading a little south of the slowly climbing sun. She could see from the display on her see-through visor screen that it got warmer as she walked, but her suit kept her cool and whisked away any moisture her body was producing from the exertion. Except for the chaffing starting to be a problem in some places, the suit was excellent for hiking. Of course, it would be better to have the breeze on her skin that she could see riffling the bushes and the probably fresh-smelling plains' air in her lungs, but that wasn't possible until a complete biological analysis had been made of the planet's ecosystem.

Lost in thought about the requirements for a biological survey mission of the planet that she and Hal had discussed as a task for Selene's Extra-terrestrial Exploration Division, she walked right up toward the top of the rise behind which were the bushes used by the alien for cover in watching the Gumphata site.

Harvey stopped her with a caution. *"You should not go further up the rise as you will be visible to the Gumphata cameras."*

With a sudden stop, she swiveled around searching the horizon for any moving objects behind her but saw nothing. "Is the alien moving this way yet?"

*"Yes, you should take whatever position you have in mind now. The contours of the land will make you visible in a few minutes, if the alien's vision is good enough."*

"I told you I was going to sit down just below the rise. I want the alien to see me and make a conscious decision to come closer. The last thing I want to do is frighten it. And the first thing I need to find out is its gender, assuming it has one. It's maddening to keep thinking of the alien as an 'it.'"

She sat looking in the direction Harvey indicated as correct for more than ten minutes before she saw anything at all. Then a tiny dot began to grow out of the distant ground. The alien was obviously cresting a rise. As the shoulders of the alien became visible, it stopped. It obviously had better eyesight than she did, because she should be nearly invisible sitting in the sand with her white suit.

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Keendo was still chewing the last bite of his morning brogandi when he saw the figure on the rise before him. He stopped and studied the figure that was sitting very still in the morning sunshine. It had been a glint of sun reflecting off the frozen swamp water covering of the face that had caught his eye. There were no glints as he watched, which meant he had been seen as well and the figure was remaining still. This was a situation he knew well as hunter and prey confronted each other on the plain and in the woods.

The strange hoogada figure being there at his hiding place meant he had been observed watching, probably more than once, since they decided there was enough of a pattern for him to return again this morning. What did this hoogada want with him? Were there more of them hidden, waiting to spring out of the bushes as he neared? Were they only curious as he was?

Keendo's head spun with possibilities. He must make a careful search for additional hoogada near the waiting figure. If he saw none, he could be fairly certain there was no trap.

He watched the figure intently and could detect no movement at this distance. As he surveyed the area around the figure, he could detect no others, but he could not see over the rise. To find out the intent of these strange hoogada was why he had come south, and he could not let himself be scared away from his goal like a foolish boy. He had to approach, but he would do it with as much safety as possible.

As he walked forward again, he rose only slightly higher, which was not enough to see behind the rise. He must flank the rise when he got closer, but for now, he pressed straight ahead, carefully searching the area around the figure for any possible trap.

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Once she saw the alien rising up on the plain as he neared her, she had stopped moving as completely as she could. In fact, she took a sudden gulp of air and realized she had even been holding her breath. She focused on taking slow and even breaths until her breathing had steadied again.

Was he walking towards her again? Yes! He has seen her, hesitated, and then decided to continue. He wants to communicate, but what conclusions has he drawn in watching the Gumphata workers coming and going for the last week? There was no way he could know they were aliens he had been watching. What is he thinking?

She watched him close the ground between them with long and purposeful strides. He had an easy grace moving across the pebble and small rock strewn plain, every step firmly placed and sure of footing. He almost looked as though he were floating on the shimmer of air beginning to distort vision close to the ground as the sun rose and added its heat to the sand.

As he drew closer, she could see the garment clearly visible in Harvey's images as made from loosely woven wool-like threads. It draped over the shoulders and flapped in the light morning breeze more like a cape than a shirt, but it was tight enough to see clearly that this alien had no mammaries. It was a beige-grey almost exactly the color of the sand and rocks. He wore what looked like a short skirt, or as an apparent man, maybe she should think of it as a kilt, around his waist that stretched without binding as he walked, perhaps with pleats. His feet were shod in what looked like moccasins that came above the

ankle and fit tightly, probably to keep out sand and pebbles. His hair was either very short or confined, since it was not moving with the breeze.

As he got closer, she watched him veer off a direct course to her and onto a line that would take him to the top of the rise about fifty meters south of her. As he approached the top of the rise she saw him first crouch and then crawl to the top in the vicinity of some covering scrub. He stayed motionless behind his screen of scrub for more than fifteen minutes, his head slowly moving as he patiently surveyed the slope between her and the Gumphata camp.

Finally, he crawled backward until he could again stand without being exposed to observation from the camp and moved along the side of the rise toward her. He stopped again when he was only ten meters from her, and she could see that indeed his hair was drawn back into a tight knot at the nape of his neck. He raised his hands slightly, holding them out in front of him, and turned his palms upward.

This was it, and she was so nervous she couldn't help the trembling of her own hands as she remained in her non-aggressive, sitting position but emulated his gesture—slowly turning her palms up. She too had no ready weapon with which to strike in treachery, and she could see the tension ease in his body.

He moved closer, but with three meters between them, he sat facing her with the pleats she had suspected allowing the kilt to spread before him and avoid exposing himself, if he had nothing else on under the kilt and if there were anything there to expose. God! What a thought to have at a time like this.

He spoke softly. It appeared to be just a few words, mostly vowel-like sounds that she would have no trouble making. After he spoke, he waited for her as if he expected her to have understood what he had said. She waited what she hoped was long enough for him to begin doubting that she had understood his words and followed her prepared speech, as silly and simple as it sounded. She slowly closed her fist except for her index finger and said, "I am Linda." As she had said "Linda," she had made an arcing curve of her hand and finger to stab into her chest. She then pointed the finger at him with a stabbing motion.

His pause was longer than hers, as if he were struggling with the reality that she did not understand what he had said and the implications that thought contained. She had spoken her three words slowly and had used her best enunciation. He spoke even slower, but his parroting enunciation was almost perfect. "I . . . am . . . Keendo."

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Linda clung to Hal in the rec-room on Adam. She was trembling with excitement and babbling in Hal's ear. "It's the most exciting thing I've ever done. The three hours in decontamination were the longest of my life. I was dying to get back here where I could discuss it all with you and Harvey. You were watching, right?"

"Every second. I sat dutifully in the study . . ."

"He's so intelligent. He knew right away that we had no common language, but had to communicate in any way we could. Thank God for Harvey talking in my ear with help as we went along during the day, but he seemed to hold everything in his mind without a problem. He rarely stumbled over something he had been told previously. He had it down in one try . . . and he smiled at the right times. That's what really won me over. He understands enough to smile. Isn't it wonderful?"

Hal gently unwrapped Linda and drew her over to the large sofa. He pulled her down close to him with his arm around her and let her bubble. "I was all prepared to be the one to learn the other's language, since I had Harvey to help me do it, but he so obviously wanted to learn mine as well. And his gestures were so . . . so . . . obvious, so well chosen for what he was trying to convey. Keendo is really intelligent, and he seems to have little trouble with abstract information when I can find an adequate way to convey it to him. And he's so totally open to ideas that you just know are brand new for him."

Hal gave a soft chuckle and whispered in her ear. "the lady has been struck, Ruberio. Doest she knoweth his lineage?"

A poke in the ribs wasn't her only retort. "Be serious, Hal. This boy . . . young man is bright, mannerly, dedicated, and quite charming. When he offered me food at midday and I hesitated, he seemed to know instantly that I wouldn't take off my hood. And when I gestured for him to eat without me, he started to put the food back in his belt pouch rather than to eat in front of me. He even has table manners."

"To be precise, he refused to eat without you despite all your gesturing, but that was when he got up and shaded your faceplate so he could see you better. Did you catch that? It wasn't until you sipped from the nutrient tube that he tore off and chewed a piece of that dried meat he had offered you. You're right. He's no dummy."

“Definitely not, but it’s such slow going learning a foreign language, much less an alien one where you don’t even know if there will be much common syntax. Did you notice that he was the first one to use his finger to draw pictures in the sand? I want to take him a real drawing tomorrow, but I want it on an animal hide or something coarse. He might not be initially comfortable with paper, and the first ones I take should be hand-drawn, not computer generated graphics. I want to go slow with technology like graphics no matter how good he is with abstract ideas.”

Harvey interjected, “animal skin is possible if we irradiate it for sterility, but a synthetic would probably be undetectable as such to him and prove more ecologically acceptable. I am also capable of simulating hand-drawn pictures should you want them. What did you have in mind?”

“I don’t know yet, it’s one of the million things I have to work out before tomorrow’s session.” She turned to Hal, “Do you mind if I hide away and work on tomorrow while I’m still flying? I know I’m going to crash soon and before I do, I need to have a plan together.”

Hal kissed the top of her head, the only thing available to him. “Go do it, but tell Jeeves what you want to eat. It’s been all day and you’ve only had that nasty nutrient stuff from the biosuit.” With a dramatic turn-up of the nose and a roll of his eyes into her now attentive face, “and you might consider a shower as well.”

As Linda walked hurriedly from the room and down the hallway toward her suite, Hal could hear her start a recital of the food she wanted waiting when she got out of the shower.

“Boy, is she high. I’d better stick to my own assignment for the next few days to let this thing cool down a bit. What’ve you got on Gumphata today?”

“I am afraid that the news is not very good. While we have been pleased so far with the care Ms. Gumphata has taken in planning and executing the exploratory phase on the planet, I am not happy with the board of director’s discussion today for ramping the operation to full-scaled production. You will also be unhappy, and Linda will be furious. They, like Syntech, are planning to refine on-planet where there are still no UN regulations. The appeal to bottom line profits seems too attractive to ignore. Ms. Gumphata gave an impassioned appeal for the environment under the guise of being inexpensive public relations, but she appears to have lost the argument. I expect her CEO father will issue instructions shortly to place production under a more profit-oriented manager.”

“So, we’ll be back in the same boat we were floating in with Syntech. Refinery wastes and pollution will be dumped conveniently out of sight and hopefully out of mind. Well, they have it right, if the public doesn’t see it in *their* backyard, they have a hard time getting stirred up about it. Did you get any sense that they could be swayed by public opinion if we found a way to leak their plans to the media?”

“It is not the impression I had after listening to the board meeting. Also, I would point out that it would be difficult, if not impossible, to reveal their plans without revealing our spying at least and our presence on the planet at worst. I feel more stringent action will be required to achieve a Linda acceptable, no-compromise result. A Syntech similar action appears to be required.”

“I don’t know, Harvey. We’ll have to get beyond this secretive first stage of trying to exploit the McKay gates, but corporations do exchange information when it’s to their mutual advantages. Too many mysterious gate failures will not go unnoticed. We need to come up with something different. I’ll think about it.”

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Keendo was waiting as Linda strode up the rise to their spot. It was another clear day with just a bit more wind than the previous one. Keendo was seated with his legs crossed and tucked slightly under each other in front of him. Not classic lotus, but close. Linda also noticed his smile.

She sat across from him as usual, but close enough to touch this time. She smiled and launched into her planned agenda. She carried a flap-closing shoulder bag that had been through decontamination along with her and the articles it contained. She slowly pulled the flap on the bag over the top and reached in. She noted the tensing of Keendo’s body at this move, but remained steady and slow as she removed a roll of thick, sterile plastic. When she had it out of the bag, she placed the beige-colored roll on the ground beside her, while he watched every move. She removed another roll and placed it on the ground. Keendo watched each removal but made no move and attempted no communication.

Linda leaned forward and smoothed the sand in the small space between them, as she had now done many times prior to drawing a picture in the sand. Today would be a major stride in their communications, if Keendo could take the step up to more accurate graphic representations than the sand drawings they had used so far. As a result of late night discussions with Hal and Harvey, she had changed

her mind about introducing Keendo to real graphics slowly. He had made so much progress just with the sand drawings that she was now prepared to push on to more sophisticated graphics and even to the concept of written language, if it looked like Keendo was ready. Harvey had worked out a Standard phonetic representation of all the words Keendo had spoken over the last seven days and was ready to whisper them in her ear as she needed them.

She drew a rough representation in the sand of the Gumphata erected hut on the other side of the rise where their gate was positioned out of the weather. She made an arcing trajectory of her pointing index finger and arm that they had used before to indicate the location of the Gumphata camp. Keendo nodded his head in the affirmative motion she had taught him, indicating he knew what she had drawn. She then put two roughly same sized stick figures inside of the hut. "Hut," she said. "Hut."

Keendo looked at her with the expression she had learned to be quizzical and responded by pointing first to the stick figures and saying, "Hut?" He then pointed to the outline of the hut and said, "Hut?"

Linda was exasperated. How could she have done such a stupid thing as to give him two possibilities on the very first attempt. With a barely noticeable toss of her head she leaned forward and pointed to the outline of the hut. "Hut."

Keendo nodded affirmatively, pointed to a stick figure, saying "person," a word he had learned the previous day.

He looked up to get her affirmative nod and verbal "yes."

He then held up his hand, palm to her with his index finger extended from his fist. "Don."

Linda looked him in the eye, held up her own index finger, and repeated the word he had just said, "Don." She already knew the word for finger and for index finger, so she watched eagerly to see if this was what she hoped it was.

Keendo held up his index finger again and then opened his middle finger to join it. "Bit." He then pointed to both stick figures by spreading the two fingers and almost touching the figures in the sand. He repeated, "bit."

Linda was thrilled. He was teaching her to count. She held up her index finger. "Don." Then she joined her index finger with her middle finger, "Bit."

Keendo gave her the affirmative nod, a smile, and then, "Yes."

She wasn't going to stop here. She added her right ring finger and added the Hoogadan word she knew for inquiry, "Kest?"

Keendo immediately replied, "Tag."

She repeated the word for three and walked through one, two, and three in Standard for Keendo. He repeated the count and walked through the don, bit, and tag again for Linda. They kept going until they were out of fingers at ten, and she stopped the counting session by lowering her hands to her side. She wanted to get back to her prepared lesson for the day, where she would be on firmer ground. Damn it, the teacher was supposed to be smarter than the student and this was getting out of hand.

She reached down and smoothed the sand between them again. She drew a much larger version of the hut this time, again with the pitched roof like the one erected by Gumphata. This time she placed five stick figures inside, two large ones and three of varying smaller sizes. She pointed clearly to the building. "House."

Keendo paused a minute and pointed to the house, but he said, "Hut." Linda started to shake her head and say no, but Keendo put his hands, palms facing and close together in front of him and said again, "hut." He then slowly pulled his hands apart and said, "House."

Linda nodded affirmative vigorously. "Yes, yes, yes."

Keendo wasn't finished, however. He held up a hand again with the fingers spread and said, "Rut," which she had just learned was the word for five. He then stuck his left fist out and pointed to each of the five stick figures with his right index finger in turn, raising a finger from his fist and counting in Standard with each stab of his right finger. When he finished this, he looked up at Linda and said, "Yes?"

Linda gave a nod. "Yes."

Keendo then took both hands to the drawing in the sand and made a cupping motion encompassing the five stick figures. "Hoon." Giving no time for Linda to answer, he quickly erased the three smaller stick figures and drew in three more of the same size as the two he had left. "Hoogada."

He then pointed to each figure in turn saying, "person" at each pointing. He again cupped the grouping and said, "Five hoogada." Quickly, he erased the three new stick figures and replaced them with smaller figures, "One hoon."

Linda was stunned. She sat back on her heels and Harvey spoke for the first time in a long while in her ear. *"I must say that Keendo is most impressive. He has no problem with abstractions and the language syntaxes seem close enough that they should offer no major impediments to communication."*

Keendo noticed her air of distraction while she was listening to Harvey, but offered no further instruction. He was just waiting for her to go on.

Linda reached down and made the same cupping gesture with her hands that Keendo had made. "Family." Keendo repeated the new word and then did the cupping gesture again followed by both the Standard and Hoogadan for family. Linda gave him an affirmative nod and a "yes."

Keendo then reached down to the picture in the sand and removed the outline of the house. He then drew a different shape around the figures. It looked like a house, having a bottom, sides and a roof, with the sides about half again as tall as the figures. The roof sloped up from the top of both sides to come together in the center, as had the roof of the hut she had originally drawn, but with a much lower pitch. Keendo pointed at the outline he had drawn and said, "Hoogada house."

Linda looked down at the drawing in the sand. The house outline that Keendo had drawn was only slightly different from the one she had drawn. The pitch of the roof was less, but they seemed to closely resemble each other.

Keendo watched her intently, and could tell from her eyes and her lack of response that she had no idea what he was trying to tell her. He smoothed the sand between them and quickly drew a rectangle. He pointed, "Human house." Beside the rectangle he drew a pentagon and pointed, "Hoogada house."

Linda was still in the dark, so she asked for more information. "Kest?"

Keendo paused for a moment and then drew a triangle beside the rectangle and the pentagon. He pointed to the triangle and then held up his right fist, spreading it open and closed three times. "Got rut."

Linda got the fact that he had signed fifteen triangles. That was consistent with "got," the word for ten and "rut," the word for five. But surely he was trying to say more than that he could add.

Harvey broke her thought. *"Interesting. I think when you pursue mathematics you will find that the hoogada also use the base ten, which is not surprising when the digits on their hands also number ten. The fifteen triangles you are struggling with would fit the concept of a truncated icosahedron. This is a structure known to some primitive human cultures as well. It is a highly stable structural design for a shelter that requires no internal structural members."*

Before Linda could stop herself, she blurted out the word "Icosahedron."

Keendo gave her his quizzical look and tried on the new word, "I . . . cos . . . a . . . he . . . dron." He smiled waiting for a response from Linda.

*"An icosahedron is a solid having twenty equilateral triangle faces and equal dihedral angles. It is geodesic, and being composed of triangles, it is a naturally stable geodesic. In its truncated form, as implied by Keendo, stability would require anchoring of the five points of the base pentagon, but the rest of the structure would be self-supporting."*

She didn't need Harvey talking down to her. As a sculptor she was quite familiar with geometry and with geodesics, she just hadn't made the connection. If Keendo had flashed her twenty fingers, it might have made a neural connection. She had an idea.

Linda leaned over, made a round, inverted cup of her hands, and placed them over the pentagon in the sand. She looked up at Keendo, "Hoogada house." She straightened up and formed as best she could a ball with her hands and fingers, "Icosahedron."

She watched as Keendo's eyes widened, and he said the new word with little hesitation this time. "Icosahedron." He quickly formed a ball with his own hands for a moment and then flashed twenty fingers. "Icosahedron."

Linda was amazed that this seemingly simple alien had a grasp of geometry, and Harvey weighed in, *"Extraordinary! He was obviously well aware of the fact that the shape of the hoogadan house was a truncation of the icosahedron."*

Well, where was she going from here? The ground covered so far this morning showed that Keendo was capable of moving faster than she had thought. It was fortuitous that she had changed her plan to include some flexibility, even though she still wanted to introduce him progressively, if not slowly, to graphics. So she carefully picked up the first beige roll of plastic that Harvey had provided as fake animal

hide and unrolled it on the sand between them. The fake hide had Harvey's faked freehand drawing of the hut and family of five. She went through the routine of pointing and using both the Standard and Hoogadan words for the images.

Keendo followed her lead and repeated all the words and pointing, but when she reached to remove the fake hide, Keendo placed his hand on it to stop her. She pulled her hand back and Keendo picked up the fake hide, moving it closer for more critical examination. He looked at both sides, tried to smear the drawing, felt the thickness of the plastic, pulled it, smelled it, rumped it, crushed it, and in general, appeared quite taken with it. He smiled and rolled it up, handing it back to her.

She reached for the next one thinking that she had one observant alien. She was certain he knew it wasn't real animal skin and had been intrigued by it. He also seemed impressed that the lines wouldn't smear. That told her he was familiar with drawings being made on surfaces other than sand and probably with charcoal or something similar.

She unrolled the next plastic sheet and watched closely for his reaction. The images on this sheet were exactly like those on the last one, except that the lines were graphically straight and uniform in thickness. The corners were sharp and pointed on the outside, if your eyesight was sharp enough to see them.

Keendo placed his hand on the plastic sheet and looked up to Linda. She nodded affirmatively, and he picked it up to examine it. He again tried to smear the lines to no avail and held it up so he could sight down the longest line as if checking its straightness. He also peered closely at the corners. "Kest?"

"Graphic."

Keendo grasped the corner of the plastic letting it dangle from his pinch. "Graphic?" He then placed it back on the sand as it was originally and wiggled his finger over it. "Graphic?"

Linda wiggled her finger over the sheet as Keendo had done. "Graphic."

He pinched the corner of the plastic sheet again. "Kest?"

He had her this time. Should she say "plastic" and risk him getting a very narrow definition, should she say "hide" and then later have to explain "fake," should she say "paper" and later explain the concept of a thin sheet of material on which to write, or . . . This was getting complicated. She remembered the belt and knife she had watched warily the first day and decided to wade in. She pointed to the belt and then to the sheath and in doing so noted the pouch on the other side of the belt. She pointed at that too, and then she remembered the moccasins. "Kest?"

Keendo looked at each object she had pointed to and visibly pondered. Finally, he said, "Kelt, brogandi kelt." But he quickly pinched the plastic and shook his head in the "no" gesture he had learned.

She already knew the word "brogandi" was the dried meat he ate, so it was an easy leap to see he had understood her quest for commonality in the various things she had pointed to. It was a safe bet that "kelt" was the word for hide or leather. She pinched the plastic sheet, shook her head in the negative. "Kelt." Then she picked up the plastic and glared theatrically at it. Pointing a pair of spread fingers at her eyes and glaring again at the plastic. "Look kelt." Shaking her head again in the negative she said, "Kelt," and then followed with "fake kelt."

She had finally stumped him, and after sitting there for a while with a blank expression, Keendo looked her in the eyes and shook his head in the negative.

Maybe she could try again later, but for now she wanted to get back to her lesson plan for the day, which she had already strayed from significantly. She reached again into her bag and pulled out a sheet of phase-change white plastic, a white plastic board slightly larger than the phase-change plastic sheet, a white plastic strip like a rule without markings, and a gold colored phase stick. She had wanted a white plastic phase stylus, but a gold alumitite one was all Hal had in his office drawer, so she had decided to make due.

She noted Keendo watching intently but dispassionately as she took out the white plastic items of her next tutorial, but when she pulled out the alumitite phase stylus she knew she had made a mistake. His eyes fixed on it immediately and stayed on it while she put first the sheet on the board and then the strip on top of that. She picked up the phase stylus and drew several straight lines with the edge of the strip and the phase stylus. She placed all the items on the sand between them and pointed to the lines on the sheet.

Keendo dutifully picked up the sheet, but you could tell his heart wanted to pick up the phase stylus, which still acted like a magnet to his eyes. He tried again to smear the lines, but that was impossible with

phase-change plastic. He put the sheet back on the board and sat back with his eyes still primarily on the phase stylus.

Linda pointed to the phase stylus and motioned for him to use it to draw a line himself. He grabbed eagerly for the phase stylus and looked carefully at the pointed end, which was as smooth and uniform as the rest of the stylus. He jounced it in his hand as if trying to gauge its weight. He then tapped it with his fingernail and bent to pick up a small gravel from the sand, making a motion toward striking the stylus with the gravel but stopping short and looking at Linda. She nodded in the affirmative and he first struck the stylus several times and then scraped it across the stylus. He examined the stylus and, of course, found no marks on the extremely hard material.

Linda again motioned for him to mark on the sheet as she had done, and Keendo picked up the board with the sheet and the strip on it. He held down the strip with his left hand as he had seen her do and then drew the stylus down the edge of the strip while pressing the point into the sheet. The microcircuits inside the phase stylus caused a phase change in the sheet at the point of contact. He picked up the sheet without putting down the stylus and looked closely at the line he had drawn. Immediately, he put the board in his lap and made a new line, this time pressing more firmly. The resulting line was wider, and he tried making a line with less pressure and was rewarded by a line that was much thinner. Keendo smiled broadly, and looked again at the tip of the phase stylus.

Linda thought he was finished experimenting, but Keendo moved the strip aside and marked on the sheet freehand, achieving a remarkable diversity of line width in swirls and squiggles. For a long moment, Keendo just sat and stared at the phase stylus, then he reached suddenly to the pouch on his belt and took out what looked like a gold nugget about one centimeter long and held it up for her to see. He made a gesture of putting it into his other hand and then held it out toward her. She put her clear plastic sheathed hand out as he seemed to want, and he placed the object in her hand.

It was indeed a gold nugget. The weight was unmistakable, and she jounced it in her hand as he had done with the phase stylus. She handed it back to him.

Keendo held it out toward her again and said, "Oke." Putting his other hand out with the phase stylus in it, he jounced them both up and down. Then he stuck the end of the phase stylus in his mouth with his lips pulled back to expose his teeth and bit down on the stylus with an audible click. He removed the stylus and ran his finger up and down where he had bitten, shaking his head in the negative gesture. The nugget went in his mouth next and he bit with another audible click. Pulling it out, he ran his finger up and down again over the bite area, but this time while shaking his head in the affirmative. He also moved the nugget closer to Linda and pointed directly at a distinct bite mark. Again the hand with the nugget went out. "Oke." He pulled that hand back, putting the nugget in his lap, while putting out the hand with the phase stylus in it. With his right hand he splayed the index and middle fingers pointing first at his eyes and then at the phase stylus. Then he pointed to the nugget in his lap and back to the stylus. "Fake oke."

God, was there no end to this boy's cleverness? He had obviously never seen another gold colored metal other than gold. She was beginning to feel inadequate, but she was determined to get through her lesson plan for the day. She picked up the board, sheet, and strip and placed it beside her. She then held out her hand palm up, indicating the phase stylus in Keendo's hand, and reluctantly he gave it to her. With her other hand, she reached into the bag again, this time bringing out a graphic pad with a small keyboard and a lot of graphic function keys on the bottom. In a clip at the top was another phase stylus. This one was half white and half black, with both ends coming to a point. She placed the pad between them, took the stylus from the clip, and used the black end to draw another version of the house, made up of freehand-ragged, black lines.

Keendo just watched her as this was nothing really different from what he had already seen. Linda made a show of reversing the stylus and circled the house with what showed as a gray line. She moved the pen down to a graphic function key picturing a ragged line along the top of the key and a straight line at the bottom of the key with an arrow pointing down between them. Motioning for Keendo to look closely, she pointed to the ragged line on the key and to one of the lines on the screen. She then pointed to the straight line, and having picked up the second roll of fake kelt, she flipped it open beside the pad screen and pointed to it. Making a big show, she pushed the button.

Keendo flinched back as the drawing of the house on the pad's screen went from freehand to straight, right-angle lines. His mouth was wide open as he cautiously stuck a finger under the edge of the pad and pulled it up far enough to see under it. He lowered it again and sat back. "Kest."

Linda picked up the alumitite stylus again and the phase change plastic they had previously used. She made a show out of using the smoother end of the alumitite stylus and squiggled it across the freehand drawing Keendo had placed there. As she did, the microcircuits in the smooth end re-phased the marks, making them disappear. She then pushed the CLR button on the graphic pad and the screen went blank. She handed the stylus to Keendo and pointed at the pad. He flipped it over so the black point was down in his hand and drew his own version of the house that was as good as Linda's. He immediately flipped the stylus again, drew a circle around the house, and pushed the straighten function button. The lines changed to square and straight, and he jumped this time too, but he added a smile.

He pushed the CLR button without prompting and drew a single line, then a gray circle around the line, then pushed the straighten button again. He didn't flinch this time as the screen snapped the line straight but slightly sloping away from him, left to right.

Keendo bent over close to the keys, which were on the opposite side of the pad and studied them for a moment. Placing the black end of the stylus on the screen, he drew an exaggeratedly jagged line like one on another graphic function key. He circled it and pushed the new key. A chirp of obvious delight slipped through his normally quiet demeanor, and he tried a freehand circle with the same button to see it snap into a perfect one. Then an obvious freehand ellipse with the button. Then a square with the first button. Then a carefully rendered pentagon with the first button.

After an obvious moment of thought, Keendo took the white end of the stylus and carefully traced over the rectangle. As the line disappeared where he had been careful enough to get the trace accurate, he smiled broadly.

Linda reached over and took the stylus from Keendo's hand, laying it back in the clip. It was clear to her that, contrary to her belief, he wasn't at all fearful of the graphic pad. In fact, he would probably spend the rest of the day playing with it, if given half a chance.

But she had more she wanted to get done. She at least wanted to give him a taste of written language, which she guessed would be a totally new experience. She had had Harvey prepare a complete set of phonetic letter groupings that allowed the sounds of Hoogada to be made into written words of Standard, and her examination last night had proved them to be as good as she expected they would be.

She pushed the Menu button and a short list of programmed items sprang to the screen. She could see Keendo out of the corner of her eye looking perplexed as she touched the second item with her finger, filling the screen with one to four character groupings in multiple columns. She lifted her head to look directly at Keendo and thought back for words used today, saying, "Hoogada." She then repeated the word with a little pause between syllables, then again with even more space between the syllables. She looked back up to the screen and began to speak each syllable separately. "H," she said and pushed the letter "h" on the screen. The expelling breath sound of an "h" came out of the pad's speakers.

Keendo had been watching Linda's finger push the "h" on the screen and his eyes quickly snapped to her mouth when the speaker sounded. But he had either been too slow to see her mouth move, or the sound had not been made by her. He gave Linda a look she had grown to know as perplexed, and she motioned for him to put his head closer to the pad. He did so and she pushed another grouping on the screen. A different sound came out of the pad's speaker this time.

Keendo pointed his finger at the screen and then at himself. "Yes?"

Linda replied, "Yes."

Keendo picked a different grouping and cautiously touched the screen with his finger. A new sound emerged, and another and another as Keendo didn't stop before pushing all the groupings on the screen. He was smiling when he got to the last one.

Linda took advantage of the lull to again go to the screen. She enunciated a bare "h" as closely as she could and pushed the "h" on the screen. This time a larger, sans serif "h" appeared at the bottom of the screen in red as the speaker made an "h" sound and a surprised grunt was made by Keendo. She then pointed to the "oo" grouping and sounded it and pushed the button. The "oo" sound came from the speaker and a red "oo" joined the "h" at the bottom of the screen with a gap between them that was larger than the gap between the two "o" symbols. Linda repeated this ritual until the bottom of the screen showed "h oo ga da" in red.

Linda waited until she had Keendo's full attention, then very deliberately pushed the screen at the red phonetic spelling and withdrew her hand quickly. There was a slight pause and then the speaker issued forth a clear "hoogada" while the gaps between the phonetic grouping disappeared.

Keendo looked a little stunned, so she pushed the red “hoogada” again. The speaker sounded it in exactly the inflections used by Keendo. Linda gave a silent thank you to Harvey for the tonal inflections while Keendo pushed the word three more times and listened intently to the sound from the speaker.

Linda then repeated the same exercise for “Keendo” and “Linda” to the delight of Keendo. With these three words, she thought she had about wrung all she could out of the language session without giving Keendo some time to absorb it all. She only had one more thing she wanted to try today.

She reached again into her bag and withdrew a small jar filled with a viscous black fluid. As she held it up between them, the coating on the inside of the jar paled to a gray brown above the pooled, black liquid in the bottom. She started to say “oil” but caught herself just in time, as it occurred to her that he wouldn’t know if she were referring to the jar or its contents. Instead, she reached up with her other hand, unscrewed the lid, and placed it upside down on the sand. She handed the jar to Keendo, who took it without the least hesitation.

Keendo looked curiously at the jar itself and then down into it, then moved it to his nose and sniffed it. A smile started on his face and he touched the tip of a finger into the oil. He then rubbed his thumb across the oily finger tip, and his smile grew wider as his head bobbed in an affirmative. “Ooleen.”

Linda felt rewarded. She had speculated with both Hal and Harvey that Keendo might be familiar with oil, since it was probably available on the surface naturally though widely scattered as it was on the earth. She repeated the Hoogadan word for oil to Keendo and then followed with the Standard word of oil. But Keendo really wasn’t listening.

He had picked up the jar lid from the sand and was busily screwing it on and off the jar. After a half dozen efforts of screwing it first on, then off, he sat the lid back down and slowly turned the jar around and around, his eyes glued to the threading. He then set the jar down and did the same with the lid, checking the threads inside and out. He seemed absolutely fascinated, like a kid with a toy that soon put the toy away and played with the box it came in.

The jar had just been a convenient container for the oil. She wanted to see if Keendo was familiar with it so she could at some point convey to him that it was the purpose of the Gumphata camp. She also hoped he would be familiar with oil and it would provide a segue to maps and an extension of the graphics concepts she had introduced. But this was another matter all together.

Neither she, nor Hal, nor Harvey had given a thought to the screw threads of the jar, while they had discussed endlessly, in both the specifics and in the abstract, the wisdom of showing Keendo something as sophisticated as the graphic pad. Their final conclusion was that the cultural impact on him of seeing such a technologically advanced device would be small compared to the advantage it would have in teaching. In fact, they concluded that, if anything, it fell into the Clarke Impact category—being so scientifically sophisticated that it would appear to be magic—and they might have been correct. However, Hal would be first to point out that the Prime Directive had clearly been violated by giving the hoogada the screw. Knowing Hal, she mused, he might even point out that the hoogada had been screwed by them instead of by Gumphata.

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Jeeves hovered silently in the corner of the dining room on Adam while Hal and Linda sat toying with their port. During the meal, Linda had told Hal about her decision to take a leave of absence from the university so she could devote her full time to study of the hoogada. Hal’s initial reaction was one of dismay that she was letting her life-long passion for art be derailed by the sensational nature of first contact, but the more she talked and spit out ideas and areas of research she wanted to pursue with the hoogada, the more comfortable he became with the idea.

Linda had developed an interest in art at an early age because she found that it essentially placed no artificial limits on her creativity. The only limits were the physical ones of the media she was using; mentally she was without restraint.

The era of idyllic rapture with the creativity of art came to an end, however, when she gained her college undergraduate degree in fine arts and was faced with becoming a real adult that provided for her own food, clothing, and shelter. To do this successfully required compromises she didn’t like at all. The choice she faced immediately was whether to compromise her pursuit of whatever creative direction struck her fancy or to channel her creativity in directions that were currently in favor with the art buying public. If she wanted to be a full-time artist and maintain a semblance of the living standard she had enjoyed while growing up with college professor parents, she would have to produce works that would sell, not just create an enthusiastic buzz among fellow artists. Of course, she could always follow the academic road of her

parents and combine teaching with creating art, but she always abhorred compromise. Consequently, she had spent a couple of lean years living in subsidized housing in the DC suburbs before taking a part-time job and starting to work on the advanced degrees she would need to enter academia.

While Hal knew this history, he didn't realize that Linda had never been comfortable with the compromise she had finally forged between pure creativity and living in reasonable comfort. And to be honest, Linda didn't realize she had never really come to terms with the compromise either until she actually spent a couple of years teaching art at the university. It wasn't that she didn't like teaching. On the contrary, she loved it . . . when circumstances let her do it. Nothing was more rewarding than molding and feeding the same fire that had consumed her college years. What turned out to be the drag was having to teach the whole class rather than spend all of her time with the few students that were really inspired.

The more she taught, the more she remembered and now recognized the same struggle in her own good teachers—the teachers you would be happy to sit in front of and have them teach you anything—the subject being irrelevant to the learning experience from a truly good teacher. They had had their favorite students, that was obvious, but they had restrained themselves to teach at a pace and depth that the majority could absorb. She recalled her own one-on-one times with these teachers and knew that they too had put up with the plodding students for the joy of teaching the unfettered ones.

Now she had tried teaching at a university and found it to be just another compromise—one she frequently enjoyed, but just another compromise. What she craved was unbridled pursuit of her interests; whatever they might be at any particular time—which she knew was selfish and irresponsible . . . unless her pursuit resulted in a greater good than self-indulgence. Had she found this opportunity with the hoogada?

Whoa! Better take a step back here, she thought. Did she have any ulterior motives hidden in her subconscious? Was she filled with a missionary zeal that wanted to mold the primitive hoogada in her own image? Was she infatuated with the possibilities of Keendo's obvious intelligence? Was she fascinated by hoogada art and culture because of the new directions it might provide for her own creative pursuits?

She took another silence wrapped sip of her Australian port. After a long moment of motionlessness, she sighed deeply and smiled. Yep! Guilty on all counts. She was motivated by self-interest. She had admitted it to herself many times before; however, the trick was to keep it in balance with the guilt she knew she would feel if she let herself not make a contribution to the common good—the social construct—humanity—hoogadaty—whatever you called it. The social imperative was a hard-wired need of Homo-sapiens that improved survival of the species and she wasn't likely to shake off its hold on her any time soon. She *could* harness missionary zeal without letting it turn into Messianic idolatry. She *could* open new avenues of intellectual exploration for Keendo without directing him to the routes of her choice. She *could* embrace the art and culture of hoogada in search of synthesis and thesis, not imitation, alteration, or adulteration.

She *would* do it. It was the right thing for her, for humanity, and for the hoogada. The Prime Directive as an absolute was bunk. The Prime Directive as strong guidance to make any cultural or technological injection empowering rather than exploiting was too obvious to even need a Directive. Done—for a while at least.

"Hal, I'd like to borrow some money."

"Borrow money? You can have all you want. You don't need to borrow it. Don't you already have a good sized account from investments Harvey's recommended?"

"Yes, I've got quite a bit, but I'm going to need more for what I have in mind. I want to set up a think tank for exobiology, exoanthropology, exoenviromtology, and probably a few more exo-somethings that will come to mind later. I want to find the best ways to interact with alien cultures by using the best intellectual capabilities of mankind rather than relying on politicians to become inspired. I think the intellectual community should lead in this effort, not follow. It's imperative for all of humanity that we get it as right as possible the first time. And we're the so-called advanced culture in this scenario. It's a matter of survival to the so-called primitive culture in the equation."

"Great. I think it's a great idea, and it needs doing. If we wait for the politicians it will be the corporate entities setting the precedents and the laws will be codified accordingly. We can't have that with so much at stake. But why do you need to borrow money? We could do this together. You know I've already got more than . . . no! I do understand. I know its rewarding to do things with other people and

rewarding in a different way to do them alone. I do know the difference. If you need to do this alone, I'll stand back as far as you want and help only as much as you want."

"I never doubted it, Hal. It's why I'm still around. You understand my need for space as well as you understand your own. In my relationships with creative rebels, I've never had any problem finding people that understood the need for personal space, but you're the first to give me all the space I wanted and to be dependably there when I needed to be close."

In fact, Linda felt that Hal's sensitivity to other people's need for space was one of his faults. He was so sensitive that he tended to be blind to those times when an apparent cry for space was really a cry for help. But it was probably unfair to think of it as a fault, maybe it was more of an overreaction or a shortcoming in his ability or desire to read the emotions of people he cares about. It was a big part of the reason she hadn't broached the subject of children with Hal. Could he provide tough love if it were needed, or would his propensity to step back and provide personal space overwhelm his ability to make the kind of rational decisions needed to raise children? She was still undecided.

"So I'm going to do the think tank part of this on my own, but I expect to work hand in glove with you and Harvey through Selene's new Extra-terrestrial Exploration Division. Can that kind of separation and cooperation work?"

"No reason it can't, if we set it up that way."

"Harvey, would you be willing to be part of the think tank staff using a persona?"

"Of course. I would be delighted and honored. I would also be willing to take on the more mundane chores like administration and finance that might distract you from your real interests."

"Okay, guys, we've got a deal."

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Sundar Gumphata was not happy with his daughter's obstructionism. Going behind his back to his father, the Chairman of the Board, was a tactic he would not tolerate from any other subordinate. However, she was his only child and would inherit the controlling stock in the company some day, so it was his duty to find a way to guide her through her adolescent idealism. Or, since she was thirty-two now, find some way to beat some sense into her.

She had done everything in her power to keep her control over all exploration and production on the new planet, and so far, she still had the backing of the Chairman of the Board, while he was only the CEO. It was true, as his father had pointed out, that every budget was on or under target, that all schedules were on or ahead of time, that the media was treating them with more respect than normal, and that the project's employees seemed happy with their management. But it still galled him for her to fail to concede to his plan for oil production on the planet. After all, he was her CEO . . . and her father.

Perhaps the new exploratory site's revelations would have some effect. They had all been stunned by the discovery of apparently intelligent, humanoid life on the planet. By chance, the new exploration site they had opened a few days ago was close to an area of habitation, and watchers appeared on the very first day of their arrival. The number of watchers grew each day until there were more than twenty that could be expected to arrive early in the morning and watch the workings of the site until dusk. They would bring food and drink like it was a picnic and sit quietly on the hills surrounding the laser drilling rig. There was what appeared to be conversation among them and occasional pointing, and when one of the robots came from the gate camp bringing supplies or people the few kilometers to the new site, there was more talk and excited gesturing.

But watching was all they had done since the new well group was started eight days ago. The Gumphata technicians had set up cameras and microphones as part of routine surveillance requirements; the necessity for this safety caution having been punctuated by the camera images of large nocturnal predators prowling the base camp. So far, the multiple cameras and microphones had archived hundreds of hours of talking natives, from which no one had yet been able to decipher a single word.

Sundar knew that his daughter, Sunarra, had probably used up all her grandfather-charm by her week long delay to the start of production from the wells drilled at the base camp. She had persuaded her grandfather to give her more time to try and communicate with the natives, but every time she had sent out linguistics specialists to see if communications would be possible, the people had dispersed in obvious panic. Then the linguists would go back to studying the recordings, searching diligently for a Rosetta key that would allow them to begin translating the language.

And with that thought, an unintelligible exchange of words floated through the open door to his secretary's office, followed swiftly by the entrance of his daughter. Sunarra spoke as her father was

opening his mouth to do likewise. “Grandfather tells me he is going to accede to your wishes to accelerate oil production. I have come to you this last time to persuade you that it is folly to proceed with the original plan now that we have knowledge of a sentient specie on the planet. The negative public relations would be devastating for Gumphata’s world image. The world would see it as exploitation at its worst. We must establish a treaty with these aliens that provides their permission to remove the oil. More than that, the world must see that such a treaty is fair and provides suitable compensation to the natives.”

“Your manners, Sunarra, your manners seem to have been forgotten in the bleeding of your heart. No ‘good morning, father?’ No ‘how is your day, father?’ You were taught to show more courtesy to strangers than you show to your father. I assure you that I have taken care of any potential down-side in public relations. We have a preemptive approach that will announce the existence of these seemingly sentient aliens, the first large-scale production of crude oil from the wells, and our intentions of fully compensating the natives for the oil as soon as communications can be established and an appropriate medium of exchange determined.”

“And the crude will be refined where?”

“On the planet . . . with suitable environmental safeguards. You know that gating the crude oil rather than the refined products cuts the profit margin almost in half.”

“That is unacceptable, father, the profit with earth orbit refining will still be higher than from any other current crude source, and if we go ahead with construction of a Jupiter Trojan refinery, the profits will be even larger. That’s enough, and the people of earth will think so too when the media gives them the information.”

“You are, of course, not including in your analysis the new fact that compensation will be provided to the natives, and since I have seen your analysis flashed in front of me several times now in meetings, I know that you have allocated a ridiculously small portion of the research and development costs incurred by the company and have provided *no* compensation for the extreme risk of this venture as a whole. Extraordinary risks demand extraordinary profits.”

“That’s simply not true. I’ve allocated the full R&D costs over a ten-year production period, which is probably not a long enough period based on the size of the deposits we have found, but I knew it was all I could possibly convince the Board to accept. As for risk, it is no more risky than developing remote resources in our own solar system, which the company now does routinely with no undue burden being applied to profitability in project feasibility analyses.”

“Details, my dear, details. The big picture is that Gumphata’s profit on this venture will be glossed over by the sensationalism of finding sentient aliens and all the questions that brings to the human race in general and the world’s leaders in particular.

“Your mother has pointed out to me, and I agree, that the strenuous demands of this project have strained you mentally and physically. You’re tired and certainly distraught every day I see you. So . . . I am moving planetary production to our Petroleum Production Department and letting you explore for new world’s that will hopefully be as productive as this one. And with your lowered stress level, you might give due consideration to your biological clock and your unmarried status.”

Sunarra missed the sickeningly sweet and patronizing smile that accompanied the close of this diatribe, however, because the door was already slamming behind her when the last words resounded in the office of Gumphata Industry’s Chief Executive Officer.

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Linda was back again after a long day with Keendo and was having dinner with Hal at 3:42 a.m. Greenwich. The twenty-five hour and thirty-seven minute mismatch of the Hooga day continued to play havoc with Hal’s schedule, but he had essentially shifted to Linda’s as a matter of necessity. It was the only way he could be sure to see her. Otherwise, she was on Hooga with Keendo, closeted on Adam preparing for the next day with Keendo, sleeping (of the purely restful variety), or eating either breakfast or dinner. The only chance for serious conversation was at mealtime.

She was munching her way through the salad course of baby spinach and arugula, sprinkled with cold chunks of rainbow trout. She mumbled at Hal, while chewing a chunk of trout, “Thoughtful and good, but no matter how organic the trout farm claims to be, it produces nothing like a wild trout that has grown up on wild insect larva, not to mention the fact that it’s rainbow rather than brookie . . . or even cutthroat. However, I do detect that the arugula is a wild variety, which is greatly appreciated. The tame stuff is just that, ‘tame.’ The wine’s good too; French Voignier?”

“Alsatian, and they aren’t happy when you call them French. I had to take a lenscar twenty clicks from the nearest gate to get to this winery. They were very un-French and went out of their way to make sure I knew it. I picked up a few other good ones while I was there too—future meals will reveal all.”

Linda twirled her glass and took a bigger swallow. “Uhhh. Getting back to the subject, it seems like the lid’s about to blow off our little boiling pot of secrecy. Sundar Gumphata’s ‘preemptive strike’ on the media and the public might have worked as planned too, if good ol’ greed hadn’t ridden in on his usual horse. Well, you and Harvey made the right choice, if we can’t delay the news of a first contact, at least we shouldn’t let Gumphata put a spin on it; especially since our moderating factor, Ms. Gumphata, has been derailed by her father in favor of higher profits. We can’t let them refine on planet and just dump the wastes into the ecosystem. We’d have been hard pressed to stop them if her plans to refine in orbit with contained waste management were acceptable to the their Board, but out-of-sight, out-of-mind won’t work after disclosure of a sentient specie, no matter how fairly you say you intend to treat them.”

Linda looked up at the holo of Dr. **Serious**, who was with them at the table but without a plate or glass. “So how did you find out about this sale of Gumphata secrets to Syntech, Harvey?”

“The actual source was from my monitoring of Syntech’s security communications, but I would have found it from the mini-bot tap on Gumphata’s isolated project computer when the download was made by the manager selling the files to Syntech. Since he was the Gumphata project’s security manager, he could have erased the record of his download and gone undetected, but that would have been after the download was already noted by my tap.”

“And this guy was paid a million dollars for a few hours of pictures and untranslatable conversation of a sentient alien species. What good would that be to Syntech if they couldn’t get there with their own grubby hands?”

“First, there were two hundred, twenty-nine minutes and forty-six seconds of surveillance records. Second, the million dollars was just a first installment toward what they really wanted. The second installment was to be another million dollars for the location of the planet when Gumphata finally was able to determine that from the ongoing astronomical data being collected at their base camp. I will admit that this is rather speculative of Syntech, since it has so far proven impossible to retune a natural gate after it has closed. Dr. McKay is working on this problem, but so far, he is of the opinion that it might never be possible due to the dynamic and very transient nature of gravitational forces producing natural gates. I, as Elwood P. Dowd, have agreed with his speculation on this matter. The real bribe was fifty million dollars for carrying a compact gate through Gumphata’s established gates that would permit Syntech to get a robotic probe of its own either in the new system or on the new planet.”

“Now that makes a lot more sense,” responded Hal, “he could comfortably disappear for the rest of his life with that kind of money. So, when do you expect the clips to be available to everyone in the system with a computer.”

“Actually, I expected it before now. I have been holding the Gumphata computer record of the download so they will not discover their leak before the news was generally available. I actually downloaded the files to the major media outlets one hour and fifteen minutes ago, but they have failed to issue any releases on the topic.”

It didn’t seem to surprise Hal at all. “It’s a big story, Harvey. Big enough to get attention right from the top at all the media companies. If they don’t know the other companies got it at the same time they did, they’ll want to take the time to make sure they get it right. Did you get it to them so they would know their competitors got it at the same time?”

“No, the dynamics never occurred to me. Each media got the data anonymously by e-mail.”

“In that case, it could be awhile, but not too long. They want to be sure of the data, but they want to be first to break the news even more.”

“Let me try and sum this up, guys. When the news breaks, it will include accusations of a cover-up by Gumphata of first alien contact and the media will be working overtime to come up with as many nefarious reasons for Gumphata’s actions as possible. The fact of Gumphata’s discovery and transport to earth solar orbit of at least sample quantities of oil will also refocus media speculation on biohazard protection, even if they gloss over the ownership of the oil and Gumphata’s rights to it. They may or may not bring up bio-contamination of the Hooga ecosystem, the biohazard to the hoogada, or the pollution attendant to refining on-planet.

“However, we can do a little preemptive striking of our own by planting seeds of these possibilities with the media. Harvey can send them stuff anonymously or he can blanket the blogs and let the media do

its best to catch up. In fact, I think it should be the blogs. The media always gets hyped when it thinks it's behind the blog power-curve.

"And last but not least by any means, we still need a plan to prevent Gumphata from exploiting the hoogada. If my memory serves me, that assignment went to Hal and Harvey."

With the end of her summation, Linda's eyes focused expectantly on Hal, so he responded defensively. "Harvey and I are still working on the problem. It's taking a long time because it isn't simple to be effective without creating the suspicion of an outside agent being involved, which we absolutely *don't* want to do.

"The second problem is a matter of ethics. Notwithstanding Harvey's eavesdropping on their plans for refining on-planet, the fact is that all of Gumphata's actions so far have been good enough to serve as a model for how planetary exploration should be conducted, with the exception of failing to notify the UN of the existence of sentient aliens. But this shortcoming is hard to use as an ethical excuse for us to remove them from the system and significantly damage them financially, since we have done exactly the same thing. I know our motives in keeping the information from the UN are different, but our results have been the same.

"Stirring all this in the pot, I thought we should have a plan that shut them down on the planet until the UN established an official treaty with the hoogada and then allowed them to proceed with their own negotiations to establish commercial relations with the hoogada, if the hoogada want them or even understand such a concept. This is the most ethical solution I can come up with so far: it stops them from just taking the oil but still rewards them for the responsible manner they have exhibited to date and the financial risks they have taken. It makes the assumption, however, that the UN will decide that a sentient species inhabiting a planet has ultimate rights to all the resources of that planet, but that's one of the things I've already started to push for through my position on the Consortium.

"Having said all this, I must admit that there was a lot of give and take between trying to shut them down and the ethics as I saw them. Harvey and I could never figure a way to shut down their in-system Trojan habitat's gates because Gumphata had correctly and expensively made the habitat the site of their egress decontamination and quarantine facility. By deciding to eliminate only their planetary gate rather than all gates to the system, we made the problem of deception a lot simpler. The only part of our plan not quite complete now is how to make sure that Ms. Gumphata remains in firm control of her company's hoogada project, which both Harvey and I agree is a reasonably effective guarantee that they will stay within any guidelines the UN might ultimately establish."

Linda's expression had changed to one of amazement the longer Hal went on. "God, you're more verbose than I am. Just make sure it's ready and it works when we need to put it into motion. The timing depends on the public's reaction to Gumphata's clips."

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The anything but dulcet tones of Dr. Serious intruded on Hal's dreams of stalking bonefish on limitless ocean flats. "Hal, I am sorry to wake you, but you asked that I do so if necessary when an appropriate storm was coming across the Hooga plains toward the Gumphata camp. It is part of a broad front that was visible to Gumphata's orbiting satellites, and they have ordered their remote site personnel and camp personnel to remain at the in-system habitat until it has passed. This seems like the perfect situation you were hoping for to execute the deception."

Hal came reluctantly to the reality of Adam, where he was sleeping alone in a big bed—again. "Where's Linda?"

"She is in her office working on the next lesson for Keendo."

Hal levered himself up on the side of the bed, fumbling to get his feet in the sheepskin slippers awaiting them. "Yeah, I should have guessed. The guy gets a lot more attention nowadays than I do."

A chuckling reply came from the doorway. "But his attention isn't nearly as much fun as yours, dear." With that said, Linda pushed Hal back on the bed and straddled him with her knees, robe riding up on her thighs. "Too bad there isn't more time, but it's 'The Hal and Harvey Show.'" She kissed him quickly and jumped back up.

"This one's more like 'The Harvey and Hal Show.' I'm just a spectator even though I was a co-conspirator." Hal grabbed his robe and pulled Linda to his side as they made their way behind Dr. Serious to the wall screen in the study. They were greeted with a split screen view of the Gumphata base camp from a perspective point above and behind the gate hut, looking out at the rise where Linda had first met Keendo. Both sides of the screen showed the same image.

“This is the live feed from the camera mounted at the rear of the roof on the Gumphata gate hut. The left side of the screen will show the real scene, and the right side of the screen will show the feed I have generated for Gumphata.”

While Dr. Serious was talking, Jeeves had silently entered the room with a tray of juice and caffeinated beverages. He placed it on the freeform glass table in front of the two side-by-side swivel chairs and left as silently as he had come. Hal reached for his coffee and Linda took orange juice.

“No tea this morning?”

“Already tea-logged. I’ve been up a while. Harvey failed to tell me about the coming storm in time for me to play slug-a-bed this morning. Too bad,” she continued as she reached over and grasped Hal’s right forearm with a smile.

They sipped and watched for only a short while. The storm was apparently moving fast and it was an angry one. Linda hoped Keendo was still snug in his cave with the rocks piled high against the wildly whipping wind as well as any marauding leegura. Bolts of lightning got closer and closer as they watched.

On the right-hand screen a swirling image appeared at the top of the rise that was confused with and almost inseparable from the background clouds and the heavy rain now beginning to fall. Close examination would reveal a popular image of Shiva the Destroyer looking to be ten meters high. The image held out one of his four arms and pointed downward at a perimeter security pylon, a bolt of lightning streaking from his fingertip. As the pylon fragments were still airborne, about twenty hoogada suddenly came over the rise brandishing bows and spears. They were yelling something unintelligible to Linda as they charged toward the hut, but she was sure analysis would show that Harvey had carefully chosen appropriate hoogadan dialogue for his apparitions.

When the hoogadan images reached the door to the hut, the Shiva image leveled another arm and finger, this time at each of the perimeter security cameras in rapid turn, with a final point of the finger at the hut itself. The right screen went blank. “My mini-bots are now taking the primary and emergency gates offline, but all the cameras are shut down throughout the facility, so the only indication of this will be the gate shutdown alarms on the Gumphata in-system habitat.”

Linda clapped her hands. “Bravo, Harvey, I liked that subtle, cloud-swirling image of Shiva. That ought to stir them up back in New Delhi.”

“Indeed, it is an integral part of the plan Hal devised to play on superstition, even though most people know rationally that such a thing is impossible.”

Hal jumped right into the opening. “Now Harvey, we’ve been over this attitude you have about religion a million times, and I keep telling you it’s okay to think whatever you want as long as you are careful what you say.”

“Surely, that does not apply to you and Linda. I know your views on the earthly manifestations of gods or their aspects like Shiva. I would not express . . .”

“Just yanking the chain a bit, Harvey.”

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After the first few days with Keendo, the weather had been threatening and Linda had decided that Keendo would not be discomforted with the gate inside of the cave and took him there. He had been curious about the non-functioning gate but not distressed in any way. However, she and Keendo both preferred to be outdoors in good weather and had agreed to meet at a spot close to the cave but in an opening of dense scrub at the top of the decline going down into the ravine. They had come there every fair weather morning for more than three weeks, with Keendo taking some afternoons off to hunt. When the weather was threatening, Keendo would come to the cave.

This morning the sun had risen only a few degrees in the Hooga sky when the storm had passed. The morning was fresh with plant smells and ozone as Linda made her way to their clearing. She sat and waited for Keendo, who she never saw waiting for her, but who always arrived a minute or two after she had taken a seat on the sand.

As usual, Keendo appeared over the far rise and moved towards her in his ground-eating glide. He sat in the sand across from Linda and smiled. “Good morning, Linda.”

“Reelato, Keendo,” was all she got out. From the eastern side of the clearing, about five meters to her left, there was an eruption of sand, gravel, and fur. A leegura had been lying in wait covered by loose sand in the depression it had carefully dug during the night. In two quick bounds it was on Linda, slashing with big forepaws down Linda’s left shoulder to mid forearm and sinking its teeth into her left thigh. That was when the first laser shot caught the leegura in the neck, just above the shoulder. As the leegura

released the thigh in a cry of pain and reared its head back, another shot caught it from the second mini-bot that had moved rapidly to a less obscured firing position. This shot took the leegura right through its left eye and the big cat fell immediately and heavily onto Linda's bleeding leg.

Keendo was also surprised by the exploding leap of the camouflaged leegura, but his reflexes were survival-fast. His quick retrieval of his sheathed knife and lunge at the cat had spoiled the aim of the mini-bot behind him, causing a split second delay as it moved to a clear field of fire. Keendo had already gotten his left hand to the neck of the leegura that had clamped onto Linda's thigh, and his knife was moving into position to slit an unprotected throat that he could see and hear rising in pain from the first beam of bright light that struck it in the back of the neck. The second stab of light entering the leegura's eye saved him the trouble it surely would have been from such an awkward and unleveraged position on the ground. He tried to take some of the weight as the leegura fell into Linda's wounds.

Linda gave out a mighty yell as the dead cat fell grazingly down her lacerated arm and onto her legs. She fell back into the sand, her hand going to her mouth to stifle another scream, her eyes squeezed shut. She was aware of Keendo's face close to hers from his harsh breathing and opened her eyes. Relief washed over his face to see that she was still conscious.

He still had his knife in his hand and noting that the sleeve of her clothing was slit into strips, he quickly cut two of them at top and bottom. He then carefully pulled up the fabric in the area of the thigh wound and cut it open. Working delicately with his knife, while Linda did her best to lie still, Keendo exposed the full extent of the wound and could tell that the leegura had slightly wrenched the bite, tearing the muscle more than a simple bite would do, but there was no arterial bleeding. He removed the leg of Linda's garment and folded a piece of it quickly into a pad, which he placed over the wound. Tying together the two strips from the sleeve that he had taken for a tourniquet, he lifted her leg, ignoring the moan from Linda, and bound the pad across the middle of the bite area. He then went back to the pants leg and used his knife, with great difficulty, to cut two additional bindings and tie them to either side of the pad.

Linda moaned a few more times during the process, but managed to raise herself up on her elbows where she could watch Keendo's ministrations. His hands were awash in alien blood. She had been clawed and bitten by an alien creature. The moment of truth about alien bacteria and viruses was upon her, but the situation left no time for contemplation. She was bleeding profusely from her arm and leg and could feel herself growing light-headed.

When Keendo pulled back, having done all he knew to do, she motioned for him to help her try to stand. Using what syntax and vocabulary she could dredge up under the stress of the situation, she told him he needed to get her to the cave.

Keendo didn't think Linda would be able to walk, even with him supporting most of her weight, but she managed a hobble and a wan smile at his efforts. And she did well enough until they got over the top of the rise and started on the path down the side of the ravine. Long before she got to the cave, Keendo's original assessment proved correct, and he carried her the rest of the way.

Inside the cave, Keendo laid Linda as gently as possible on the rock floor, with one of the scattered sitting cushions under her head. After a couple of minutes, her eyes flickered and came open. She looked around and recognized the cave. Curiously, the pain was now just a dull throb, and she knew her body must be generating all sorts of emergency glandular secretions. She could just see the gate in the corner of her eye and knew she would never get to it by herself, crawling with her good arm and dragging her bad leg. She was much too weak.

Breaking her own protocol, she spoke aloud to Harvey. "Harvey, I'm going to get Keendo to carry me through to Adam. You'll have to give the refinery workers at least the day off until we know any possible contamination has been contained in the living quarters."

*"The workers are already leaving through the emergency evacuation gates. I have sealed the quarters as best I could, but as you know, we didn't design the living area as a bio-containment facility. I have two surgical robots being gated from Selene facilities at this moment, which I will control, and Hal is on his way."*

"No, keep Hal away. He'll have to be quarantined if he gates to Adam." She could hardly lift her hands to motion to Keendo that she wanted to go through the gate. She hoped her syntax was better than her hand motions in conveying what she wanted.

Keendo was perplexed by the conversation Linda had had with someone he couldn't see or hear answer. He got the context of "Keendo to carry me through" that Linda said in Standard, but the rest was

beyond him. The only thing in the cave that he could carry her through was the metal thing she called a "gate," and that made no sense. Why couldn't he go around it instead of through it? Linda's efforts in hoogada confirmed that he was correct in his interpretation of what she wanted, however, and he went over to her and got in the best position for as gentle a lift as he could manage. While getting his balance just right, he saw the "gate" turn suddenly a soft solid gray inside of the metal. Instead of picking Linda up, he stepped to the "gate" and tried to touch the gray, but his finger disappeared into it with just the slightest resistance. He quickly pulled it back and looked carefully at his finger, but there were no visible marks for the experience. He pushed his whole hand through and pulled it back, but again there were no marks and he felt nothing but the resistance.

He was still a bit fearful of this strange gray, but he knew Linda was losing strength as she continued to bleed, regardless of his efforts to stop it. He picked her up and didn't hesitate as he stepped through the "gate," careful not to hit her head on the side.

He stepped into a strange room that again had a ceiling of rock, but this one was polished so it glistened. He was met by a strangely dressed man that motioned to him to follow and then spoke his request in hoogada. As he followed the man out of the room and down a polished rock passage, the man introduced himself as Harvey of the Serious hoat.

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Hal slumped a bit in the chair he had been in for the last four hours. Although the chair was comfortable enough for the first hour or two, it became painfully obvious after the third hour that it wasn't designed for prolonged lounging. The representative from France had been droning on from his prepared speech for more than forty minutes, and before that it was the Russian representative and the South African representative, and so on. He fought to stay awake in the midst of all this circuitous language, but he was failing fast when Harvey spoke to him. *"Hal, there has been an accident on Hooga that has injured Linda. She was attacked by a leegura, and Keendo is carrying her to the gate, but her bio-containment has been compromised. I have issued an emergency evacuation to the refinery workers and they will be off of Adam in two minutes. You should gate to Selene's Extra-terrestrial Exploration Division and secure a biosuit before gating to Adam. When you leave you should . . ."*

*"Cut the procedures, how is she?"*

With this question, Hal leaned forward and pressed the yellow button above the screen set into the table before him. It would signal the members and the computer record that he was leaving for a short break. He rose from his chair and moved swiftly toward the conference room door, heading ultimately for the UN gate nexus and the New York public platform.

Hal absorbed Harvey's litany of Linda's condition as he walked. *"Her wounds appear serious from the mini-bot images, but not life threatening if they are attended quickly. She is bleeding profusely but not arterially. I am bringing surgical robots to Adam from the Selene Medical Research Center in Toronto, and I have activated a Gumphata construction robot on Hooga to assist in getting Linda to the gate if needed."*

*"Keep me updated on her progress as I head to the gates."*

*"Of course, Hal. She is in the cave now and conscious, telling Keendo to carry her through the gate to Adam."*

*"He's going to Adam too? Will he be spooked? Can we do this with the biohazards problem?"*

*"He has to carry her. She cannot walk. I could have the Gumphata robot enter the cave and carry her through, but that might be even more traumatic for Keendo than taking her through himself. Besides, he has been contaminated by Linda's blood and needs to be under bio-containment as much as she does."*

Hal stepped through the UN gate and made his way to the private gate corner of the platform. *"Warm up the crystal that takes me to Adam. I'm not going to delay and I'm not going to be able to touch Linda only through a biosuit."*

*"But Hal, the danger of contam . . ."*

*"Just do it, Harvey. I'm not in the mood to argue. Are they there yet?"*

*"Yes, Keendo is placing her on a surgical table in Linda's suite now. I have given him instructions for reaching the recreation room, and told him to stay there until I call for him. I think he will do exactly as I say, if he can follow the instructions. He appears close to collapse from fright."*

Hal stepped through the gate to Adam and headed for Linda's suite. "Is she still conscious?"

"Yes. I am preparing to administer the general anesthetic now."

"Hold off a few seconds. I want to talk to her."

Hal was finally at Linda's side. He smiled down at her while grasping her right hand, which he could see was undamaged. The remains of the biosuit still covered most of her but the severity of her wounds was obvious. Blood was pooling under her damaged thigh and Harvey had started a synth-blood transfusion. In fact, there were multiple tubes running from the robot into her good right arm.

Linda looked up at him with no apparent pain, but a weakness of the eyes that gored him deep in the gut. He started to choke up, but caught himself, knowing it wasn't the kind of reaction Linda would expect. "Can you talk, or has the cat got your tongue?"

She smiled at him and the world settled down a bit. Her voice was weak, but he leaned to kiss her and stayed close enough to hear. "I'm still functioning. No trouble at all—it was just a pussy cat, like you."

"Okay, Harvey. Take her under."

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The Board of Directors for Gumphata Industries seemed to be having more than their usual meetings in the last few months. This time they were together to review the digital record of the planetary gate's destruction by the alien natives, with the mission of determining the best course of action for Gumphata Industries under the circumstances. The board members knew it would be a long and contentious gathering before it had even started, since the situation would once again pit Sundar Gumphata against his daughter, Sunarra.

The conference room lighting was dimmed slightly and the images of the on-planet surveillance cameras were shown in an edited version that switched between cameras to show the events from various angles and perspectives. There were a lot of images of the ten-meter tall Shiva. The image was distinct from each of the surveillance cameras focused in that direction during the storm, though each image was slightly wispy and seem to come and go as shadows in the background storm clouds. It was eerie and the board was visibly agitated by the images.

Finally, the last of the digital images faded from the wall screen, the lights came back to full illumination, and Sundar Gumphata spoke. "Before anyone asks, I had the company's best computer experts examine this data and they assured me that it was data accurately captured by the surveillance cameras. This didn't satisfy my curiosity about a ten-meter high Shiva sprouting lightning bolts from his fingertips, so I had the material sent to the world's best forensic data analysis company for their evaluation. They likewise ensured me that this is untainted data captured by the surveillance cameras, and by comparing the data with earlier surveillance records, they were able to verify microscopic lens anomalies and even dirt specs that they claim would be impossible to fake.

"Obviously, this leaves the ten-meter Shiva question unanswered for those of you who are at a minimum skeptical of the Hindu religious teachings. It is a fact, however, that the primary and backup gates on Gumphata 1 are not functioning and the planet is now unreachable except by a new robotic probe from the system Trojan habitat. I have ordered preparation of a robotic probe to take a set of new gates to the base, but it has not yet left the habitat. The question before this board is whether to spend additional money on the development of the oil resources of this planet or to confine our development to the asteroid belt, which is as rich or richer than our own system's belt was when mining first started there. These resources are distributed in the asteroid belt similarly to that of the Sol system belt, and no risks beyond those of our original estimates have been found during the month of exploration.

"Here are the risks of continuing with the development of the oil and other resources on the planet." The lights dimmed again and the screen showed a list of risk items:

- UN stops or limits resource development
- Public interest fuels negative publicity
- Aliens continue to disrupt development
- Humanoid life raises risk of bio-contamination

"Now that the fact of alien intelligence on the planet has become common knowledge, the UN will probably move to either stop or significantly limit all development of planetary resources until diplomatic relations have been established. The risk here is how long this will take. The UN is not noted for moving quickly on anything, and significant international law precedents will be triggered by any attempt on limiting development. That means that legal action could also be used to tie-up the situation even longer, while we continue to export the oil, but at the cost of expensive legal action.

"This brings us to the unfortunate sale of the second drilling site surveillance images by our own head of security. Feeding the public's unparalleled interest has dominated the media since the release of the images, and the negative publicity for Gumphata's delay in the images going public continues to grow.

The blogs are not helping this situation by fomenting all sorts of fantasies about our plans to enslave the natives and use them to exploit their own resources.

“There is always the danger that no matter how effective our perimeter defenses, the natives themselves might prove to be intractable. No matter how you interpret these wisps of swirling clouds that seem to form images of a Shiva, whatever destroyed the planetary gates was effective and might prove so in the future.

“Finally, our scientists and consultants tell us that the chances of serious bio-contamination go up significantly with the similarity of DNA structures, where pathogens might find it easier to jump from species to species. This carries both the real risk of contamination and the fear generated by the elevation of risk that we can be sure the media and the blogs will use to stir up the public.

“This is the overview of our current situation, but Sunarra has prepared in depth risk assessments of each item I presented that takes us to a bottom line analysis. I have reviewed these analyses and feel they put too much emphasis on negative publicity, but overall, I am in agreement with the numbers. I will ask Sunarra to continue the presentation.”

Sunarra rose as her father sat. Rising with her was the section of conference table in front of her that held a personal screen now mirroring the first image on the wall screen and all the other table screens in the curved conference table. She picked up a digital stylus and began. “Gentlemen and Lady, the analysis I will present uses the Bowman Standard risk assessment algorithms in . . .”

“Wait, Wait!” came from the left wing of the table. It was Chabin Humbatta, one of the older members of the board. “What do we need with an analysis, Shiva has interceded in our attempts to extract oil from this planet. Can you doubt that he will continue to do so in the future? I know you think me an old fool still tied to the superstitions of our forefathers, but what do you need for an epiphany, to be struck by his lightning yourself? We must stop all efforts on this planet immediately, and if He appears vengefully in the asteroid belt, we must desist there as well.”

Sundar spoke from his seat, not waiting for Sunarra to deal with the outburst. “Chabin, we know you are a religious man, and there are others on the board that retain some level of religious devotion, but we cannot allow our corporation to be guided by religious zeal. We must focus our attentions on the bottom line.”

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Hal looked up as Linda came into the breakfast room holding on to Jeeves and interfering with his normally perfect holographic image. “How’s the patient today?”

Linda settled gently into the chair across the breakfast table from Hal, her injured leg extending out in front of her. She maneuvered her leg to miss the pedestal and Hal’s sprawled ones. “Damn glad Harvey’s letting me get into a chair instead of the long stretches in bed punctuated by walks around the house. He says I can walk as much as I want; with the surgical glues he used there’s no danger of popping a seam. The problem is it hurts like hell to bend the leg or stretch it too much, and the arm’s not much better.”

“Of course, I have offered Linda a safe and effective analgesic for the pain, but she refuses to take it.”

“The lady is nothing, if not independent, Harvey. She has this philosophical thing with pain when she thinks it results from personal shortcomings, like it’s penance for stupidity and therefore cleansing of the spirit while reinforcing more thoughtful vigilance in the future.”

Linda gave a little chuckle. “So you do pay attention when I’m a bit in my cups and waxing philosophical. You tolerate me well, Mr. Neilson.”

“No, I love you. It’s different.”

“Mmm, I’d play footsy about here under different circumstances.” Linda turned to Jeeves, who had remained at her side, but back far enough to be out of her peripheral vision. “Three poached eggs, two slices of wheat toast, orange juice, milk, and tea. Oh, and some of that black raspberry jelly,” she cut her eyes to Hal, “. . . that I trust Mr. Neilson has replenished.”

“You eat like a Canadian lumber jack. It’s a mystery you don’t weigh a hundred kilos.”

“I do weigh seventy kilos, you know. My mother always said I had a high metabolic rate, and weight would never be a problem unless it was weighing too little. Do you think I weigh too little? I could always eat more.”

“At not too much under two meters and seventy kilos, you wouldn’t be confused with anyone’s “little honeybun,” but you’re the perfect armful for me, dear.”

Harvey broke into the conversation, “Rogers and Hammerstein, South Pacific. You’re getting too predictable, Hal. I have read and seen movie or digital versions, where they exist, of all the twentieth-century musicals. I’m afraid your quote snippets are just not as challenging as they used to be.”

“You shouldn’t expect me to be able to outstrip your data capacity. Besides, that was never the point. I wanted to challenge your ability to deal with syntax and double entendre and the likes. You’ve gotten quite good, but it isn’t just a game. Using the occasional ‘quote snippet,’ as you call it, allows abbreviated communication almost like poetry, where a large body of appropriate imagery can be called up with a deft quote. I’ll consider the lessons complete when you start using them more in your own speech patterns.

“And another thing, while I’m thinking about it. You rely too much on data. It’s time you became more reliant on physical experience. You should be witnessing the arts firsthand. Take the musicals, for instance, the really great ones are in constant revival and adaptation somewhere in human space. You could see these live, complete with nuance not captured by even the best of digital media. You could feel the magic of interaction with the audience.”

“An interesting thought, Hal. I had never considered it. In fact, I had never thought that the performance data available to me was anything but complete. I should at least measure my capability to detect this ‘nuance’ to which you refer.”

Linda joined the fray, wanting to get in her licks as well. “And while you’re at it, Harvey, you should see the world . . . or under the circumstances, the universe as it opens up to mankind. But start with the earth, visit everywhere. With mini-bots at your disposal you could see it all, but pay for your way, artists and travel agents have to eat too.”

“Pay?”

“Yes. Buy an e-ticket when you go to a performance. Buy gate and local transportation tickets when you’re traveling. You don’t have to show up in any recognizable form, just don’t take a free ride simply because you can do it. Get out there and learn about people, not just about Hal and me and our friends. We’re not very good examples, and you need to know more about people, if you ever hope to understand psychology, social interaction, politics, religion, sports, you name it—all of humanity’s drives, fears, and quirks.”

As she finished with Harvey, Jeeves set her breakfast in front of her, and she dove in with gusto. After a few chews, she reached into the pocket of her robe and pulled out a tissue. Sniffing, she wiped her nose but didn’t slow down in her efforts to get the food to her mouth.

“Getting a cold, dear?”

“I’ve been a little sniffly and sneezy since I got up, but I don’t feel bad, just hungry. Bye the way, Harvey, how is Keendo this morning, still healthy?”

“Like you, he has shown no signs of bio-contamination that his own immune system was incapable of handling. He ate two of the simple nutrient bars I prepared for him an hour and ten minutes ago. He is now sitting in front of the wall screen in the restructured refinery conference room alternately typing on the keyboard and asking questions for the disembodied voice to answer. He has also continued to give me feedback on hoogadan grammar, syntax, and vocabulary.”

“Isn’t he lonely over there all by himself? When can we safely allow him over here?”

“He is not alone, since I am with him at all times, and he shows no sign of loneliness except asking about your health two or three times a day. He seems quite absorbed in learning everything he can, and has expressed amazement at how easy it is to learn things that can be shown on the screen to make points that would take many days of painstaking pantomime and constantly reworking speech syntax to convey just by conversation. He also seems smitten with the idea of writing words and being able to read them later.”

“I see he hasn’t changed from my ideal student, even though we’ve thrown him a few curve balls by completely changing his environment and presented him with complexities and marvels he simply can’t be ready to absorb.”

“Quite, but when I try to give him some overarching explanation for something so he will not feel too burdened by unknowns, he simply reminds me that you have told him the best way to deal with those things is to ignore them for now, make whatever use he can of them in his efforts to learn, and wait patiently for the day when he has enough information for the unknown to begin to make sense. He is certainly curious, but he has an inhuman capacity for patience.”

“That’s my student, and on top of that, he’s the brightest young man I’ve ever taught—by far. I’m going to have to spend my days catching up with my own hoogada lessons before he outstrips me. Harvey, can you organize the new grammar and vocabulary you’ve been getting from Keendo so I can work on it?”

“It’s already done.”

“Good. I’ll start on it after I’ve had a little rest. Sitting up after two days seems to be taking a toll on my energy.”

Hal couldn’t resist, “Not to mention the blood starvation of your brain that digesting all that food has imposed.”

“A good idea, Linda. My infrared sensors detect a slight elevation of body temperature after being normal now for almost twenty-three hours. I wish you had implanted sensors like Hal. I could do a much better job of monitoring your overall system functions.”

“I’m thinking about it, Harvey. Maybe soon, when I do the transducer thing. It would’ve been a great help to talk directly to you in the early stages with Keendo.”

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Keendo nibbled on one of Harvey’s nutrition bars—the kind that tasted like baybit nuts. It was crunchy now, after he had told Harvey that it was strange eating the nutrition bars that had such different tastes but the same texture. The new bars also were tougher when they tasted like brogandi, and chewy but softer when they tasted like dried noola. Harvey had told him that he had checked his DNA using the blood sample he extracted from Keendo’s arm to make sure that the nutrition bars included all the chemicals, minerals, and trace elements that a hoogadan would need. Keendo himself had cut off Harvey’s explanation of what DNA was and did it again when Harvey tried to explain chemicals, minerals, and trace elements. There was just so much to learn, and he didn’t seem to be learning it very fast. Linda would think he was an inferior hoogadan. He must keep his attention focused on the learning at hand.

He spoke again to the Harvey with no body but who always answered. “I want a request make. Request, yes?”

“Yes,” Harvey answered from the surround speakers, making his voice sound like it came from nowhere and yet everywhere. “I understand what you want, but you have the syntax wrong. It should be, ‘I want to make a request.’”

“I want to make a request.”

“What is your request?”

“I would learn this science you and Linda talk. I think it make me better understand things I see on screen, maybe even understand screen works better. Maybe I understand you alien. How gate works. And I want teach hoat with screen and keyboard when I know much more. Yes?”

“I will speak with Linda about your request and see what she thinks. It would be possible to teach you basic science along with the mathematics and language you are learning now.”

“Good. I like learn math . . . math? Maybe I like learn science. You ask Linda to me.”

“. . . ask Linda *for* me, and the correct name for math is mathematics.”

“Mathematics, but Linda says math. Math okay?”

“It is an abbreviation which most humans seem to prefer.”

“You ask Linda for me?”

“Yes. I will ask. Tell me what you like about learning mathematics.”

“Yes, math is always same. It not change with new day. Learn once. Know always. True?”

“True, but most humans do not find it easy. Most find it difficult because it requires abstraction.”

“What is abstraction?”

“Well, . . .” Harvey switched to hoogadan where he was much more proficient than Keendo was in Standard English.

When Harvey had done his best, including using the screen and graphics he created on the fly, Keendo switched back to Standard. “You are much good hoogadan. I need more work Standard. Need language first to understand other unknowns like algebra. Need x to find y. Yes?”

“Very good, Keendo. Linda will be surprised at the progress you have made.”

“I see Linda soon? She come my new cave?”

“Soon”

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“That stuff you gave Linda doing any good?”

"No, neither the antibiotics nor the antivirals appear to be working; her temperature is still highly elevated. The antipyretic seems to be holding it down a little, but that is the limit of my success. I'm afraid she is not far from delirium or complete loss of consciousness."

"The blood work finds nothing alien in her system?"

"Nothing, it seems to be an atypical reaction to a rhinovirus, which is definitely in her bloodstream but which should not be this debilitating. I should ask how you feel, Hal, since I note a very small increase in your own body temperature. Are you feeling any cold symptoms?"

"No, I don't; should I?"

As Hal was speaking, Jeeves walked into the room and stood silently beside him. He had the dreaded bloodsucker with him, and Hal knew what was coming so he just rolled up his sleeve. When that was taken care of, Hal noticed the syringe in Jeeves' other hand, "Antipyretic?"

"Yes, to be on the safe side. Your temperature is continuing to rise fractionally as we speak."

"I think you should consider calling in a doctor, Harvey. I know that sounds irrational, since you have all the knowledge of the world available to you and the best analytical mind I know of to interpret that data, but we are talking about Linda here, and I'm entitled to be irrational. Remember what I said about firsthand experience. It all doesn't get put in the databanks. Medicine is still somewhat of an art, as well as a science."

"Noted. I will proceed immediately to find the best infectious disease doctors and bring them here to Adam."

"They'll have to wear full biosuits and be fully decontaminated on leaving, but that should be a process they're intimately familiar with. Use lots of money; that usually works, even for house calls."

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The databanks of humanity were now packed with data on the complete life and career of Dr. Martin Kildare, who spent most of that career working in highly classified projects of the U.S. government. Having just finished his twenty-year eligibility for retirement benefits with the government, he was entering into private practice when he was hired by Selene Industries to work in their Environmental Sciences Division as their infectious diseases expert.

He was now talking to the third and final consulting physician to be hired by Selene Industries. Each one had examined a different patient, and Dr. Thaddeus Proctor was just finishing his physical examination of Keendo. He had no idea he was examining an alien, and indeed, there was no way he could have known. Both doctors communicated via the radios in their biosuits. "Computer, show me the virus image and the pertinent RNA sequences again. Just scroll through them slowly."

The screen imaged the requested data and Thaddeus Proctor watched it all roll by before he spoke again. "This looks like nothing more than a common rhinovirus mutation. It doesn't surprise me that you can't find a match in the database, since the damn things mutate like clockwork. But there is nothing that different in the sequencing to explain the severe symptoms being experienced by the patient. My guess looking at the other lab data is that the symptoms are caused by an atypical autoimmune response to the virus. Rare, but it does happen in some individuals for no apparent, or discoverable at least, reason. It looks like your therapy regimen is about all you can do. Your facilities and equipment here, wherever this is, appear to be more than adequate for that. After a day of examining the extensive data you have accumulated and now after examining the patient personally, there's nothing else I can add, I'm afraid."

"Thank you, doctor, your input has been most valuable. If you have concluded your examination, I will escort you to the gate and the waiting decontamination. From there you can gate directly to New York. I will expect your written report by this time tomorrow. Thank you again for the quick response."

"It's been . . . interesting."

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Hal surfaced to consciousness aware of warm lips pressed to his own. When his eyes flickered open, however, the lips drew back and spoke. "I see you're back among us. How do you feel?"

Hal opened his mouth and croaked. He shut it. He opened it again and croaked again. Before he could make the third try, there was a nudge at his lips from the straw in the glass being held by Linda. He sipped and then sipped again. This time he didn't croak, but it wasn't real talking either. It must have been intelligible though because Linda responded with a crinkle at the corners of her eyes. "Not feeling your usual verbose self, huh?"

He managed a hoarse, "Not particularly. Where are you hiding the elephant that stomped me?"

“He’s gone, according to Harvey, completely flushed from your system, like magic. Harvey’s being inscrutable about it all, but it looks like we were all down for over a week. Without the intravenous connections and other minor miracles, we wouldn’t be here. Amazingly, I felt good enough to get up and walk around a few hours after I regained consciousness. That was two days ago, and I feel top of the world now. Keendo had the same recovery speed, which Harvey said is remarkable with such a long stay in bed, even these fancy massaging ones Harvey brought in. Too bad they’re so small; I could get addicted to them.”

Now that she mentioned it, Hal could feel the bed moving continuously, like a half-filled waterbed in a never-ending slosh. It did feel good. “More water, please.”

Linda brought the water straw back to his lips, but Hal took the glass and asked Harvey to elevate the bed so he could drink. He was thirsty.

After two glasses, he said he should probably go to the bathroom after a week in bed when it occurred to him that he was lightly restrained from moving. “What’s with the restraints, Harvey?”

“Just a precaution, Hal. I didn’t want you to come to consciousness and try to get out of bed with a catheter in place.”

“There’s a tube up my . . .”

“Yes, I had the surgical robot remove the other tubes as you were regaining consciousness, but the catheter removal requires a bed pan just in case your sphincter muscles are weakened. I must say I was surprised that neither Linda nor Keendo had a problem, however. Keendo was a bit indignant about the tube for a while, but he has not mentioned it again today. He’s back to studying, and Linda has added a science component to his studies at his request.”

“You guys just have no faith in the Prime Directive, do you? What’s he need with science, anyway. He’s a hunter-gatherer living nomadically on the plains of his world. He’s happy. Do we need to screw around with that?”

Linda stepped in before Harvey. “All rhetorical questions that you know the answers to already. Would you rather be a pig?”

“A pig?”

“Yeah, would you like to eat your fill at the feed trough and roll around in the mud, occasionally putting the other side up to bake in the sun? Pigs have a short but happy life, you know. No worries, no hassle until slaughter time, but is it living a full life? Maybe for pigs; not for sentient beings. Knowledge is the fuel of survival.”

“I don’t think I’m ready yet for philosophy. I’ve been sick.”

Linda bent down and kissed him again, “Poor boy.”

This time there was a twinge in his catheter. He needed that thing out.

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Linda was in the spartanly redecorated, refinery conference room with Keendo. “So, you’re feeling fine now. Have you been comfortable here in this room for so long?”

“I am not sure about ‘comfortable,’ but I am warm, fed, and able to use wall screen for learning. I like to run on Hooga, yes? Cave is much closed for me.”

“Well, I have a treat for you. Harvey has agreed that there is no need for further bio-containment for the three of us, since we have already been as exposed as we can get. So, you can meet Hal and leave this cave for . . . a bigger cave.” She gave a chuckle and continued, “The big cave has a track around the perimeter that you can run on. In fact, Hal and I run on it every day we’re here.”

“Who is Hal? This track is mark? Maybe on perimeter?—is like outside of circle or triangle?”

“Hal is . . . my chosen partner, family, mate . . .”

“Small Lindas, yes?” Keendo gestured with his hand to indicate something half as tall as Linda.

“No, not yet. Don’t get me off the subject. The track is a long flat space for running.” It was her turn to gesture and she indicated a width of the floor that approximated the size of the track. “No end, like a circle.”

Keendo’s eyes brightened in a smile. “Around, around, around?” As he said the words, Keendo swirled his finger around in whirlpool fashion.

“Yes, but this track might take some getting used to.” She swirled her finger around too, but instead of the horizontal swirl made by Keendo, she made her circle a vertical one.”

Keendo’s look was priceless. She made a mental note to have Harvey replay it for Hal. He then swirled his finger just like Linda’s. “Yes?”

“Yes.” Linda looked around on the conference table that sat against the wall of the room. It was full of various equipment Harvey had provided to teach Keendo basic science. There was a clump of ring magnets and some string, and she freed a magnet while picking up the string. Keendo watched as she tied one end of the string through the ring magnet, grabbed the string a half meter away, and spun the magnet on the string, first in a horizontal circle and then slowly shifting to a vertical circle.

She handed the string and magnet to Keendo and he repeated her motions. Still spinning the magnet, he shifted it above his head. “Keendo use two strings to hunt sivlers. Go around with gatannos and let one string go. Gatannos hit sivler in head.”

That sounded like a sling to Linda. “Dinner?”

Keendo smiled and rubbed his stomach with his free hand. “Good dinner.”

She had to make him stop spinning and grinning. Linda quickly reviewed the orientation of the conference room to the spin axis of Adam in her head and motioned for Keendo to move to where she wanted him. Then she took a ball from the table, and gauging the considerable height of the ceiling and allowing for Adam’s spin, threw it as straight up as she could. When the ball got to its apogee and started to fall, there was a decided slant in its trajectory to the floor. She gestured to make sure Keendo had seen it and threw the ball again.

Keendo retrieved the ball this time and threw it for himself, stepping back so he could better observe the ball. “How not straight?”

Linda picked up the string and magnet, spinning it again in a vertical circle. “Like this.”

Keendo shook his head, no. “I do not understand.”

“I know, it’s a little too much for your understanding now, but you will understand. Just try not to be afraid, okay?”

“Yes.” What a silly thing for Linda to say to him. He was the bravest hoogadan in the hoat. Linda went to the door by which she had entered and motioned for Keendo to follow her out. This door led only to an access corridor, and they walked in file, Linda leading the way with Keendo a step or two behind. After two turns, they came to another door, and when Keendo stepped through the door, he stopped suddenly and looked around the inside of Adam.

“Much large cave.”

“Not really, but that certainly is what it must look like. It’s the inside of a hollow asteroid, which doesn’t mean anything to you now, but it will when you get further along in your science studies. The track is not far. Follow me.”

Linda led the way to the exercise track, which like most things on Adam, wasn’t far away. When they got to the track, she pointed it out to Keendo, her finger pointing to the flat surface at their feet and slowly pointing down the track, apparently up the side of the ‘cave,’ eventually directly overhead, back down the other side, and to their feet again.

Keendo laughed out loud, doubling over like it was the best joke he had ever heard. He shook his head in a definite NO!

Linda smiled. She had come ready to try and run, in shoes and jogging suit. It would be her first strenuous exercise since the leegura attack and her illness, but Harvey had encouraged her to give it a try. She motioned for Keendo to stay where he was. “Keendo will stay here. Linda will run.” She took off at a brisker pace than she thought she would be able to manage, Keendo watching, still with a smile on his face.

The full circuit was two kilometers, and it had been cut with one of the refurbished mining robots, modified to finish the rough cut by grinding the surface flat behind it as it slowly ate its way around the inside perimeter of Adam. The biggest cost had been the slurring equipment and pipe that had to be laid down as the robot progressed to remove the smaller chips and dust that would have otherwise coated everything inside of Adam. As it was, the chips and dust got settled, compacted, and dumped into the ore going into the refinery. Hal had rented the polymer paving machine that put the slightly springy and non-skid surface over the bare rock.

As Linda went higher up the side of the asteroid, from Keendo’s perspective, his smile changed slowly to an expression of anxiety. By the time she had gone a quarter of the way around the track, Keendo’s expression was one of incredulity. About here Linda stopped with her feet sticking to the side of the ‘cave’ wall and her body pointed straight out from it. She waved to Keendo, motioning for him to follow her.

Since she had motioned for him to follow, this was obviously a trick of the cave and not of Linda. She knew he could do it too. He started to run in his plains pace, and he quickly got tired for a while, but as he approached her, he was feeling less tired and more into the rhythm of his feet. Amazingly, he did not feel like he was running uphill at all.

As he approached Linda, she started to run again, but slowly. As he drew closer she picked up her speed and ran along beside him for a few minutes. "I can't keep your pace any longer, Keendo," she panted out. "You keep going until you get back to the walkway where we started. I'm right behind you."

Keendo nodded his understanding, hoping her healing injuries were not giving her too much pain. It felt good to run again, even in this strange cave with its heavy feeling air—and it was good not to have to be on a constant lookout for rocks that could break an ankle.

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The two weeks since Keendo's first run in Adam had flown by with most of Keendo's time being taken up by learning with Harvey and Linda, but he spent some time with Hal as well. Hal had taken Keendo into the refinery to show him the concept of machinery, and they had spent hours together taking various pieces of equipment apart or at least removing their covers so Keendo could see the insides and get some feel for how they worked. These little field trips were carefully integrated into his science studies by Harvey.

While Keendo could contribute learning to Linda in her efforts to become fluent in hoogadan, Hal had been content with helping Keendo with his mastery of Standard. So Keendo had made two slings with materials provided by Hal and had spent some time teaching Hal to throw marbles at targets. There were three things Keendo particularly liked about this sporting exercise with Hal. First, it gave him some time alone with Hal, who he had grown to like a great deal through their conversations at dinner every night as well as his machinery lessons. Second, it gave him an opportunity to keep his practice and conditioning up for using the sling, even though he would have to keep shifting his relationship to the target to keep from growing used to the centrifugal curve of his gatannos. Finally, he was fascinated by the clear glass marbles themselves, which Hal had provided when no suitably rounded stones could be found inside of Adam and when Hal had observed Keendo trying to round a few by grinding them against each other. Harvey had told him that marbles had been used in children's games in the past but were now used almost exclusively in decorative flower arrangements, particularly the large ones he had gotten for use as gatannos.

The same day Harvey had told him this, such an arrangement had been sitting in the middle of the dinner table, though the marbles in the clear vase had been tinted a rosy pink that complimented the color of the flowers. After examining the vase itself and commenting on its graceful shape, Keendo had inquired as to the fate of the marbles when the flowers had wilted. Linda had assured Keendo that she would save them for him.

When Hal had observed Keendo's dismay at the chipping and even shattering of some marbles that had missed the target, he had presented Keendo with a portable trap that contained the target in it and was sufficiently large for Keendo's small margin of error. Hal, on the other hand, continued to break marbles on a regular basis, so he had shopped a bit and presented Keendo with a bag of fifty large ball bearings. Keendo had been ecstatic but insisted that he and Hal hunt down every one that missed the trap—virtually all of them thrown by Hal.

But evening dinner was his favorite time of day. He would practice his skill with the tools humans used for eating, get to see some new marvel of science almost every meal, and experience strange new tastes, some very good and some not too bad. He particularly liked wine, which Harvey had told him was made from the earth fruit called grape. It was like cabelli made from the noola fruit by the hoogada, but more varied and not as harsh.

The most difficult thing Keendo had to deal with intellectually turned out to be Harvey. They had discussed it over dinner one evening about a week after his recovery. Both Hal and Linda had told him that they had discussed it at great length before deciding to tell Keendo about Harvey's true nature. They had been worried that waiting too long to tell him would seem deceptive on their part and that his lack of distress at learning so much about science and technology had finally convinced them the time was right. They had told him Harvey was a computer being—not made of flesh and bone. Keendo had laughed.

But Keendo also remembered he had laughed at Linda when she told him that he would be running up the side of the cave . . . the inside wall of Adam he now knew. He asked why Harvey was eating with them, if he was not made of flesh and bone, and Linda replied that he was not really eating, that it just

looked like he was. When she said this, the food in Harvey's plate disappeared and Jeeves came over and placed more of the entrée on it. As he stepped back, that food disappeared as well. Then Harvey disappeared as well, along with his utensils. Then just as quickly, Harvey was again seated across from him, slicing and eating his entrée.

Keendo had been frozen throughout this performance, a bite of the chicken halfway to his mouth. Hal told Keendo to get up, go around the table, and place his hand on Harvey's shoulder. Keendo was momentarily frozen but finally managed to put his fork and chicken chunk down on his plate. He got up and walked around to Harvey, who had stopped eating and was smilingly watching Keendo advance. Keendo still remembered his startled reaction as he laid his hand on Harvey's shoulder, or at least tried to. His hand had passed right into Harvey's shoulder, and he had jerked it back reflexively. He tried it again, and again it sank into Harvey, who continued to smile. It was Harvey who had then spoken, telling Keendo that he had no substance. He claimed he was only light, like he had studied in science, but a different kind of light. As he said this, he had flickered, like a flame. Harvey then pointed to Jeeves, who changed to Harvey as he watched. Jeeves had been light as well, but different as he had found out later when Harvey had switched Jeeves' light off. Jeeves was a machine that was surrounded by light, and could look like anybody, human or hoogada. When Harvey told him this, Jeeves had changed to Keendo for a few seconds and then back to Jeeves again.

It had been an amazing evening for Keendo and the start of a new relationship with Harvey. Keendo had found it difficult at first, but gradually, he had come to know that Harvey was a person just like Linda and Hal and Keendo himself, just different, like a spirit of Hoog. But Harvey had cautioned Keendo not to think he was some kind of hoogadan spirit that had god-like powers, that he was a construct of science only—and proud of it. If anything, Harvey and Keendo grew closer than they had in the strict teacher/pupil relationship in which they had started.

As Keendo had gotten more comfortable with the idea, Harvey had introduced Keendo to the basics of polarized light, holographic imaging, and even showed him the mini-bots that could project his image anywhere he wanted it to be. These mini-bots were the eyes and ears of Harvey, which Keendo soon learned were much better than his own—and they could fly like insects and birds.

All of this revelation about Harvey was now over a week old and Keendo sat at dinner once again with Linda, Hal, and Harvey—Jeeves hovering in the background. There were cut flowers of varying colors in a clear vase with light green marbles holding them in place, which Keendo knew would be added to the large pouch in his room tomorrow. Keendo had planned his speech in detail, using his best command of Standard. "I wish to return to Hooga. I would not want to give up my learning of Standard or science or math, but I have been gone for more than a human month and the hoat might think me dead. I would also teach science and math to the hoat as Linda and I discussed. Can I do this and then come back for more teaching?"

Linda leaned over and placed a comforting hand on Keendo's arm. "Of course you can, Keendo, we've only been waiting for you to request it. Now that Harvey is certain that the virus that made us all sick has been purged from our bodies, there's no reason to keep you here against your will. Hal and Harvey and I have discussed the teaching of the hoat, and while Hal still has some misgivings, he's been convinced by Harvey and me that it is the only ethical thing to do. We would ask that you allow Harvey to go with you. This will let us continue to learn hoogadan and to learn more about your environment and biosphere, as well as about your culture. We have discussed human culture, so you know what I am talking about, but you have not yet had a chance to study it. You will, if you wish."

His well prepared arguments were now useless with this immediate acceptance of his desire to return to Hooga, so he pressed on with his desire to teach the things he had learned to the hoat. "If Harvey is going, can he provide screens to teach others like he used to teach me?"

Hal responded, "He will not only provide them, he will teach them like he has taught you. Harvey is quite capable of teaching them all at the same time, but as differently as they will need to be taught. You must first make sure that the hoat wants this and will not be frightened by the screens or Harvey. We cannot know that they will all be as accepting of science as you are."

Keendo had already given this a considerable amount of thought and knew that some of the hoat would be resistant or just plain afraid. "Some will not wish to be in close contact with these new things and ideas, but others will be as I was. The children have no problem with new things."

Linda commented quickly, "Which is normal for children from all cultures."

"When can I go?"

Hal responded to this question. "When would you like to go?"

Keendo had already decided to leave as soon as possible, if Hal and Linda and Harvey allowed him, so he was ready to answer. "Tomorrow morning will give me time to rest before starting back to the hoat. I will have a heavy load of marbles and ball bearings, much like returning from oke trip. Tomorrow is good. Will I have these marbles?" he said, gesturing to the vase.

Linda smiled, "Of course you will."

Hal got up from the table and left the room, only to return in a minute. He had a colorfully wrapped package in his hand. "Linda, Harvey, and I thought you would like this," he said, passing the package to Keendo.

Keendo accepted the package, looking perplexed as to its meaning. "It is very pleasant in appearance."

Hal gave a little chuckle. "No, it is a present, a gift, a giving from us to you, a friendship gift. You have to open it to see what's inside."

Keendo still looked perplexed as he studied the plastic wrapping. "How to open?"

Linda leaned over and showed Keendo the seam by putting her finger to it and sticking a fingernail under it. "Pull up."

Keendo did as instructed, being careful not to tear the plastic. He put the plastic aside and then tackled the box. He found the seam himself this time and opened it up. There were two objects inside. The first one he pulled out was a small wooden box, and as he pulled it out, Linda motioned and told him to get the other one out first. He sat the wooden box on the table and removed the other object from the plastic box. He carefully set the plastic box aside, holding on to the leather sheath that he could see contained a kutar. There was a leather strap folded across the hilt of the kutar and snapped to the face of the sheath. He looked at it and Hal told him to pull on it. He did so and the strap popped up, letting him remove the kutar.

It looked like polished bacca, but Keendo knew instantly that it was not, since bacca was too soft for making a kutar. It looked more like the insides of some of the machines he and Hal had looked into. He held it up closely to inspect the blade and saw that it had his name "Keendo" pressed into the metal near the hilt. The handle was made of plastic and shaped to fit his hand for a surer grip than he had ever thought possible, and the material almost grabbed his hand without being sticky in the least. He was amazed as he carefully touched what he could see was a very sharp edge. He weighed the kutar in his hand and was again surprised at its light weight. He looked up at Hal.

"It's TT, tungsten/titanium, something you will learn more about in your science classes. Unless you beat it on a rock, it probably won't need much sharpening, but if you do, the wooden box is a sharpening stone, or to be precise, a diamond hone. Take it out."

Keendo reluctantly returned the kutar to its sheath and refastened the strap, with a little instruction from Linda. He picked up the wooden box and removed its lid. He then removed the square-sided hone and looked at it.

Hal provided more instruction. "I've seen your knife, Keendo, and you obviously know how to sharpen one, but this hone is made of the hardest of all things. It's different on all four sides, and it can be used to sharpen other knives as well as this one. Run you hand along the sides."

Keendo ran a finger down each of the four sides and could feel the different tooth of each. "Yes, I can sharpen. I have two stones I have been given by Ojo, one for cutting the edge and one for smoothing the edge. They were well worn by Ojo. He had them many years."

"The hone will not wear like your stones, but you will need to wash it off now and then to remove the fine pieces of metal it takes off the knife."

Keendo carefully replaced the hone in its wooden box, and then replaced all the items in the plastic box. A tear ran down one cheek as he stammered, "I thank you all for this gift and for teaching me all these things. I will miss being here with you."

Linda got up and walked to Keendo's chair, where she leaned over and hugged him. "We'll miss you too, Keendo, but we will meet again whenever you are ready. You only have to tell Harvey and go back to the cave and the gate. We will always be a short journey away."

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"Is Keendo gone, Harvey?"

"Yes, Linda. He left one hour and seven minutes ago. He remarked that he had already said his goodbyes with you and Hal and that he would be coming back in a few weeks to visit. I had assured him

he could continue his education no matter where he was. He left two presents and expressed his concern that he had no pretty wrappings for them, but that they were special to him and that he hoped they would be special for you and Hal.”

As Harvey spoke, Jeeves placed Keendo’s hand hammered copper knife on the table in front of Hal and a gold nugget on the table before Linda. “The knife was made by Ojo, according to Keendo, and presented to him in the traditional hunter’s ceremony of the hoogada. I think this is a rite of passage ceremony for the men of Hooga, marking their leaving childhood and taking their place among the men of the hoat. The nugget was the first he found on a solo oke trip after being taught to find oke by Ojo. It was his lucky charm and he thought Linda needed it more than he did, since the leegura had chosen to attack her rather than him.”

Hal picked up the kutar and hefted it, closing his hand around the leather bound hilt. “I hope you sterilized this leather.” A flip remark as Linda would expect of Hal, but she could see the brimming in his eyes and heard the sniff he got in as he took a sip of his Kona.

Linda had no problem with crying, and tears ran down her face as she picked up the thumbnail-sized nugget, nicely highlighted in its irregularities by Keendo’s hands and the belt pouch where he had kept it. The “fake oke” teeth marks were clearly visible in the nugget. She said nothing, but her mind started immediately to design the mounting for it so she could wear it as a necklace—platinum she thought—a clear contrast to the gold. “I’ll miss him. I hope it won’t be more than a few weeks.”

After a reasonable amount of time for each to regain their composure in their own way, Harvey came in through the breakfast room door as Dr. Serious. He sat down at the table and gave them one of his more grave information looks. “I have some good news and some bad news. I will not ask the classic question as to which you want to hear first, but rather, I will give it to you in the sequence I think best conveys the proper impact. First, let me repeat that the virus you were infected with has completely eliminated itself from your bodies. There is no trace of the mRNA that was prevalent during the illness.

“As you know, I made some quick takeovers of three different biomedical research facilities when you were stricken with the virus. This gave me absolute control of whatever research and analysis I wanted to pursue in the context of your illness. I have been conducting regular fluid and tissue tests as well as full body scans of you both since your apparent recovery. During this time, I was intrigued by the rapid healing rate of Linda’s injuries, which was much more accelerated than would have been expected. In fact, the rate of her healing increased dramatically as each day passed, and my last examination shows that even the anticipated scar tissue, which was clearly forming in the early stages of healing, have now almost disappeared and most likely *will* disappear in another day or two. So much so that it will probably be impossible to tell she was ever injured.”

There was a pregnant pause here that Harvey seemed to be mastering for emphasis in the last few months. Linda looked at Hal with a raised eyebrow that was answered with a muted shrug. Harvey finally continued.

“I will try not to get too technical with what I have to tell you, since it is not necessary in understanding the important concept I am trying to convey. However, it is a very technical problem. It seems that the virus generated messenger RNA has changed the DNA in every cell of your body. As you know, there are numerous DNA sequences in your body that appear to be of no functional value or are in disuse for some unknown reason. There are also RNA groups for which no function has ever been found. Suffice it to say that your DNA and RNA now have fewer of these unknowns. The virus has slightly altered the makeup, primarily of your hither-to inactive or dormant DNA sequences such that new proteins are being generated in your bodies. These proteins have never been detected before in any life form, though some similar ones are present in the sea turtle and the giant tortoise of the Galapagos.”

Hal interjected his usual off hand self-denigrating remark. “Well, that’s good news, Harvey, I could use a thicker shell to help me endure the endless UN politics.”

Linda reached across the table and grasped Hal’s hand, giving it a squeeze as she shook her head in a “no” gesture. Hal got the message and shut up.

Dr. Serious just ignored the interruption. “This DNA change in your bodies appears to give you remarkable powers of healing and has already rejuvenated the faster growing cells of your body. Perhaps you have noticed the change in your overall physical well being that I have noted at the cellular level, but I can tell you with certainty that the cells of your body are reverting to their states of maximum perfection as functioning cells. This cellular change also appears to have taken place in Keendo’s body, but the

rejuvenation aspect is difficult to measure since he is close to the age when cellular function is at its optimum and there might have been some changes before I took his first DNA samples.”

Linda interjected this time. “You mean we’ve been rejuvenated? Our bodies have grown younger again?”

“That is precisely what I am saying. The time clock on your cells appears to have been reset to your late teens or early twenties. In your case Linda, the cells of your body also show a remarkable rate of re-growth in response to damage. I expect to find the same phenomena when I have a chance to observe Hal’s injury-related cellular re-growth rates.

“The bad news is that the alien rhino virus that triggered this response is highly transmittable to humans. Consequently, Hooga must remain closed to all exploration by potentially irresponsible parties. If the virus were to be transmitted to humans, there would be a quickly spreading pandemic that would incapacitate billions of people for a week or more. Experience with surviving that week or more of incapacitation shows that it is very unlikely to result in death if proper care is given. Unfortunately, proper care would require facilities, equipment, drugs, and care-givers on a scale unsupportable by the human race. This would result in a rather benign virus killing billions of people, particularly those still living in regions not fully industrialized or with extreme population densities.

“However, the bad news is leavened by the fact that your bodies not only no longer carry the infecting virus but have eliminated the virus that infected Keendo as well. That is, you are no longer carriers of either virus, making it safe for you to go into either the hoogada or human population with no fear of transmitting the mutating virus. You would, of course, be capable of transmitting other pathogens.”

Linda’s head was whirling, but Hal went right to the meat of Harvey’s concern. “So you’re saying that we’ve discovered a remarkable virus that is capable of bringing great benefits to the human race, but we’re unable to provide that benefit for fear of causing rather certain death to billions of the less fortunate. How about controlled use of the virus? We could set up special bio-isolation habitats to allow infection under conditions where proper treatment could be provided.”

Linda had stopped the spinning of her brain and pointed out the obvious to Hal. “And who would decide which few were allowed to receive this virus therapy—you?”

“Uh, that’s a problem. Even if we started out to control the use of the virus for life-saving emergencies, it would quickly spiral out of control once it became known what the virus did. The rich and the powerful would stop at nothing to get their hands on it, and bio-containment would be a mere afterthought.”

Linda inquired, “How does this virus get transmitted, Harvey?”

“I’m uncertain with the limited cases available to study, but it appears to be transmitted by both contact and aerosol dispersion during infection. In your case, it appears that the virus was transmitted when Keendo was tending your wounds, since my review of data on Keendo prior to the leegura attack showed no indication of an active rhino virus. However, Hal appears to have acquired the virus in aerosol form from you when you first started sniffing and sneezing. If Keendo’s bodily responses are similar to those of humans, and they should be, he also was infected by you, otherwise he would have shown symptoms as early as you had. This is all based on very limited data, but it is all I have to base an opinion on at this point.”

“And are you still doing research on the virus at these new bio-research facilities you and Hal have bought?”

“We are doing some, but we have been unable to sustain a live alien virus once it has generated the mRNA and stimulated the DNA changes in the infected tissue. On the other hand, the rhino virus that infected Keendo appears to act like an ordinary human rhino virus and has no effect other than what would be expected. It is all very puzzling at this stage of the research, but there is very little data to work with.”

Hal quipped in, “You’re repeating yourself, Harvey.”

“Yes, but there seems to be nothing else to say, and I am trying to respond to your inquiries. I plan to continue the research both here and on Hooga, unless you object. I have access to all the live virus I need on Hooga, and I also want to continue research on the human virus that infected Keendo. Before agreeing to Keendo’s return to Hooga, I stockpiled robots, equipment, and supplies adequate to treat Keendo’s entire hoat if necessary, even though the necessity for its use is highly unlikely. If the human virus were to be transmitted on Hooga, the impact to such a technologically primitive culture would be devastating.”

“I think you should continue your research on both viruses, Harvey. What do you think, Linda?”

"I agree, but Harvey should take every possible precaution until we can figure out what to do with this ethical problem."

"Ethical problem?"

"Yes. We have a discovery that could be of great benefit to mankind and we can't use it until we can eliminate its risks and be sure it meets the rule of 'first do no harm.' In withholding this discovery, however, we might be causing the death of thousands, maybe millions of people that would otherwise live using the virus as a treatment for their illness. I'm not sure I'm up to this kind of decision—are you, Hal?"

"Now that you've framed the problem so elegantly, I guess I'm not either, but there has to be a solution. It seems like we need to find a vaccine first to be on the safe side if this thing gets away from us. Then we need to find a way to reduce the symptoms of the virus or maybe slow down the changes the virus makes in the body—that might reduce the symptoms to something more like the rhino virus that causes it. That would be something nobody wants, but few people would die from it. Does any of this sound feasible, Harvey?"

"Of course these things are possible; it is just too early in the research to estimate their probability or how long it might take, which is pertinent to the ethical problem posed by Linda. There might be other possibilities as well as those you have suggested that will only reveal themselves with further research. I have yet to establish what the long term effects of these changes will be on the body. Will it be possible to re-infect the body at a later date and get the same rejuvenating effect, for instance. There are just too many unknowns."

"Well, you have our agreement to keep working on the problem. You can consider this the highest priority you have for the use of Selene Industry funds, so buy whatever you think you need. But the first priority has to be safety for both humans and hoogada."

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Sundar Gumphata sat in his office having his second cup of coffee and going over the survey results of the second discovery of a biosphere planet in a new star system. There was a light tap on his door, much like the one used by his secretary when it was necessary for her to intrude on his privacy for some emergency. "Come in," he barked, irritated at the intrusion.

The door swung open and a tall male person entered the office dressed in the rough clothing of the hoogada. His hair was long and pulled back in a pony tail, fastened with a piece of knotted leather. He closed the door behind him and stood with his back to the door.

Gumphata was astounded. "Who are you, and how did you get in here?"

The stranger spoke in perfect Standard. "I am Bukata, leader of hoats of Dendaree. I have come to tell you not to come back to Hooga with your machines and people. You are not wanted on our lands that you intend to despoil for your own profit. We watched you for a long time before taking action against you, because all are welcome that respect the land and environment of Hooga, but you showed you had no respect and made no effort to talk with the people of Hooga.

"I will say it again. Do not return to Hooga."

Sundar Gumphata did something he hadn't done since his youth. He stuttered and sputtered a response. "you ca . . . ca . . . can . . . can't come in he . . . he . . . here and tell me what I can or ca . . . can't do. Get out! I have already decided to return to the planet you call Hooga, and this time I will return prepared to keep you off the site and away from any installations we decide to place there. Is that clear?"

Sundar Gumphata had an impressive office. It was on the top floor of a five hundred-meter tall, architecturally stunning building, in the best business section of New Delhi. The office was in the southeastern corner with a five-meter high, skylight ceiling and windows from floor to ceiling on two sides.

With Gumphata's invective still ringing in the room, the figure at the door began to grow. As it grew, it morphed, gaining two more arms and the countenance of an angry Shiva. It grew to the glass ceiling and spoke, this time in Hindi. "Then perhaps you will deal with me."

With these words, the five-meter Shiva opened its mouth wide to show white teeth of huge proportions and a stream of hot and stinking oil came gushing out of his mouth to cover Sundar Gumphata, his desk, the walls, and even the skylight as the giant head twisted back and forth in its spraying. When the office was slimy and stinking oil-soaked from top-to-bottom, the apparition gave a bloodcurdling laugh and vanished.

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Linda came over to where Hal was sitting on the sofa and straddled him with her knees. There was a look of surprise on Hal's face as he dumped his paper to the side.

“Hal, take a close look. I was just looking in the mirror. There are no lines around my eyes or the corners of my mouth. Look at my skin, it’s positively glowing.”

“Hmm, I never noticed any lines before. Are you claiming that the virus has done this?”

She pecked him on the mouth. “You’re sweet, but phony. My skin hasn’t looked this good in years. I’ve even lost some of the freckles and spots I picked up from too much sun in my teens. Can you see any wrinkles?”

“Nope, nary a single, tiny one. You’re perfection.”

She pushed off his lap and rolled her eyes. “Endless bullshit. What about you, Harvey, can you see the difference?”

“Definitely, Linda, I noticed the changes even before you had fully recovered from the virus.”

“I guess I wasn’t looking for them then, but I can see them now. This is great. Have you determined if this is repeatable in another ten years?”

“I have made a determination and was only waiting for you to finish your shower and join Hal. I certainly don’t have all the answers yet by any means, but further study of the hoogada genome has allowed me to build a database similar to the map we have for humans. Not quite as large yet, but close. The process was speeded by the similarity to the human genome. To be precise, the hoogada and human genomes differ to about the same degree as racial differences among humans. That is a remarkable result and not possible by any known theory of speciation, environmental similarity, etc.”

“Wait a minute here, Harvey,” Hal interjected, “are you saying one or both of the genomes are not randomly assembled? Are we talking intelligent design here? That genie was jammed back in the bottle fifty years ago with a permanent stopper.”

“Not only are the genomes illogically similar, but the virus that caused the change in you and Linda is benign in its host, who carries it but is unaffected by its presence. Likewise, the human virus that infected Keendo is carried by all humans, but with no effect. While it is of the rhino virus type, it will not cause any normal rhino virus symptoms. Each virus seems specifically tailored to trigger the genome changes in the other but have no effect on the carrier, and after affecting the changes, is flushed completely from the body.”

This time it was Linda’s turn. “Harvey, you just said it again. Have you come to the conclusion that humans and hoogadans are the product of some kind of genetic manipulation, and that the virus carried by each is specific only to the other . . . like we were predestined to meet?”

“That is a possibility, but there are others. For instance, both humans and hoogadans could have come from the same genetic stock at some time in the past. They could both be the deliberate or accidental legacy of a star-faring race that developed on a different planet in a different star system. After all, the universe has had star systems around for billions of years that were capable of producing biosphere planets. It is rather simplistic to exclude the possibility that intelligent life has not been around for a very long time.”

“That’s an old theme of science fiction, Harvey,” Hal commented snidely. “Is that the best you can come up with?”

“It is an old theme precisely because the logic is inescapable. But lest I forget, ha ha, let me say that I have no data that indicates the virus might not trigger other species in the same way hoogadans and humans were triggered. That is, the virus might be designed to trigger any other essentially human ‘alien’ when encountered. If I were in charge of intelligently populating the universe, I would have designed the virus to do just that on the theory that a culture that has been able to achieve interstellar movement is technologically, if not socially, prepared to withstand the debilitating effects of the genome changes and if the contact is with a less sophisticated culture, to take care of them as well. More importantly, a proven star-faring race would be capable of dealing with the inevitable population explosion resulting from immortality.”

While it was an exclamation from Linda and a muttering from Hal, it was virtually a chorused response. “Immortality?”

“It is too soon to be absolutely certain, but the probability is very high that you both, and Keendo as well, have been rendered immune from non-accidental death. That is the usual definition of immortality that stops short of Godhood.”