

A New Order of Things: Part I of IV by Edward M. Lerner

The InterstellarNet gave some preparation for real First Contact--but that did *not* mean it would be simple or easy!

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Illustrated by John Allemand

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"There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things."

--Niccolò Machiavelli

PROLOGUE

Good fences, said the poet, make good neighbors ... and interstellar distances made very good fences.

For a century and a half, Earth and a growing number of its interstellar neighbors had been in radio contact. A vigorous commerce in intellectual property had resulted, accelerating and converging the technical progress of all the species involved. The crowning achievement of InterstellarNet was the development of, and cross-species agreement upon, artificially intelligent surrogates as local representatives for distant societies.

Quarantine procedures strictly governed the delivery and operational environment of each alien agent, protecting agents and their host networks from subversion by the other. Some thought of this trade mechanism as a fence within a fence. Only once, more than half a century earlier, had an inner fence been breached. A trapdoor hidden within imported biocomputers, technology that had been licensed by Earth from the intelligent species of Barnard's Star, was exploited by their trade agent. The attempt at extortion had been foiled, the unsuspected vulnerability of adopted technology expunged, and the AI returned to its containment.

Good fences make good neighbors, and interstellar distances made very good fences.

Made very good fences....

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The ship hurtled through the darkness, a tiny bubble of purpose within an uncaring void. Its interior could be called warm only by comparison to the near absolute zero that surrounded it, of benefit to the proper functioning of shipboard mechanisms but far too cold to sustain any known form of life.

Relative to the binary star toward which the ship aimed, it had a velocity just above one-tenth light speed. Mostly it coasted; only occasional mid-course corrections, and even rarer blasts from its anti-space-junk lasers, revealed the presence of intelligence guiding the traveler.

That shipboard intelligence was artificial, and its mission was nearly complete. Responsive to the final directives it had been given many years earlier, it now transmitted by tight radio beam to the looming solar system.

"This is lifeboat three of *Harmony*. The crew-kindred are dead. Repeat: The crew-kindred are dead.

"My data are fragmented and inconsistent. Downloads from *Harmony* appear to indicate that systems became erratic and unstable. Records are unreliable.

"Of ten lifeboats, only seven launched successfully. None but this vessel remains. In deep space, the interstellar drive exhibits an unexplained variability. Telemetry and analysis to follow."

But the only further information sent ahead, as lifeboat three transformed into an eruption of pure energy, was by the imprinting of its one-time velocity into the blue shift of gamma rays.

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CHAPTER 1

Art tried to take life one day at a time, but sometimes several days conspired to attack him at once.

Two messages tagged with the highest possible priority code reached him moments apart, and at a spectacularly inconvenient time. He'd never received a communication of that urgency; his habit, at times when others simply disabled their neural infosphere interfaces, was to block traffic below the threshold he privately termed TEOTWAWKI.

The end of the world as we know it.

He was thirty meters behind the power boat, intent on mastering a skill easily within the capabilities of a modestly coordinated ten-year-old. A modestly coordinated Earth-reared ten-year-old, anyway. Exercise and a nanotech-enhanced skeleton only went so far ... Art's reflexes remained those of a native Martian, raised in gravity scarcely one-third standard. But wasn't the purpose of a vacation to try new things?

White knuckled, he clutched the wooden handle of the tow rope. His skis slap-slapped over the swells that had from inside the boat appeared the merest of ripples. In jaw-clenched acquiescence to gestured encouragement from the boat, he was, at the instant the first alarm buzzed inside his head, sliding down the outside edge of the vee-shaped wake.

Startled, Art let dip the tip of one ski. The water ripped the ski off his foot. From the stern of the boat, the resort's spotter shouted advice. Improbably, Art got the bare foot safely to the rear of his other ski. *Route to voicemail*, he ordered his implant as he wobbled.

Then the second call came. The remaining ski slewed out from under him and went flying. Momentum propelled him forward even as the boat throttled back. Time slowed to a crawl as the lake surface rose up inexorably to smack him. Belatedly, he released the tow handle.

He was bobbing in the water, kept afloat by his life jacket, when the launch circled back. "You okay, Art?" called the spotter. "Arthur? *Dr. Walsh!*"

Reluctantly, he returned his attention to the physical world. "I'm fine. A bit surprised is all." Only when he tried to dog-paddle to the launch did Art notice the improbable bend in his right forearm. He tipped his head at the ladder just hung over the boat's side. "Mind giving me a hand up? My arm seems to be broken."

Wincing with each wave the boat hit as it sped him to the pier, he began placing his own infosphere calls. They were rated TEOTWAWKI, too.

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While Art's grandparents and parents, like most Martians, showed little interest in pre-immigration genealogy (dubbed "ancient history"), his great-grandparents claimed roots from across Europe. His appearance supported their assertions. He had classical Mediterranean features and body build--this trip he'd seen the like on statues in museums throughout Spain and Greece--incongruously paired with pale

blue eyes and blond, almost white hair. The latter part of his heritage had vigorously asserted itself as sunburn the first day of his vacation. It brought with it a random snippet of memory, something about mad dogs and Englishmen.

The sunburn itched. The skin under his hour-old cast itched. Most of all, his curiosity bump itched. *That* he had been able to do something about.

From his villa balcony, a panorama of sky and sand and the Mediterranean Sea glowed in shades of blue and white not to be seen on Mars. Art closed his eyes, the better to take in his mind's-eye view. Across the visualized table of a virtual office an avatar awaited. The infosphere representation of Bhai Banda Singh, secretary-general of the Interstellar Commerce Union, was impeccably tailored and dignified in bearing. Bhai's control was first-rate; for all Art knew, his boss was wearing pajamas and drinking hot cocoa.

In the unseen real world, waves lapped soothingly on the beach. Art took a deep breath. "We have a situation." As though shouting TEOTWAWKI hadn't already conveyed *that*. "About two hours ago, radio volume from Barnard's Star jumped by a factor of thousands. The message body is encrypted, but it's wrapped in standard InterstellarNet protocol and addressed to the Snake trade agent." Barnard's Star lay in the constellation Ophiuchus, the Serpent Holder--which made its natives, colloquially, the Snakes. The time was long past when *Snake* was considered politically incorrect. It was the notion of being held or handled, in fact, which offended the aliens. Their name for themselves--and reserved for themselves--was Hunters. "A funny thing ... between bursts of the new, loud message, we're still getting signal at the usual power level." That pretty well encapsulated the news flash that had cost Art his first ski.

Behind the thoughtful expression of his avatar, the ICU's secretary-general was doing the math. The dim red dwarf sun known as Barnard's Star was six light-years distant. Radio signals attenuate with the square of the distance. The bursts were thousands of times stronger than the background signal. If the new transmitter was comparable in strength to the old one, then.... "We have guests on our doorstep. How close are they?"

The calculation had a big margin of error, but bosses have prerogatives. "Triangulating bearings taken from Earth and the moon, my team says less than fifty billion kilometers." That put the transmitter far outside the solar system--but also more than ninety-nine percent of the way here from Barnard's Star. Radar would need days to confirm and refine the numbers.

Art tried and failed to reach an itch with a pencil, while--he hoped--his uninjured avatar sat professionally still at the table. Fortunately, the nanodocs should have the bones knitted within days. How did people ever wear casts for weeks? "Item number two is a call from Pashwah," who was the Snakes' artificially intelligent trade agent to humanity. Then Art shared the part of Pashwah's call his boss could not have deduced, that had cost him his second ski and, damn the itch, a broken arm. "The starship is badly damaged.

"There is a crew on board, and they need our help."

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CHAPTER 2

InterstellarNet's existence discouraged the observation of several nearby stars. Measurements by the locals were invariably better and cheaper than scrutiny from afar, so telescopes were reserved for stars too inconsiderate to have scientists who sent reports.

Before InterstellarNet, amateurs had directed their often-ingenuous antenna arrays towards those same nearby stars in search of extraterrestrials. Now that ETs had been found, and humanity's dealings with

those aliens entrusted to securely encrypted commercial communications, the hobbyists, too, had lost interest in the immediate neighborhood.

In short, there was no good reason for anyone but the ICU to monitor Barnard's Star. The only reason for someone else to start looking would be a disruption to InterstellarNet. The fast-approaching Snakes appeared to have worked that out--they limited their high-powered communications to bursts brief and infrequent enough to avoid clobbering redundant copies of the many-times-repeated interstellar messages. Megacorps across the solar system started griping about brief delays in receiving long-expected messages, and the ICU's presumed incompetence. The ICU accepted the grumbling with uncharacteristic good humor.

And so the imminent arrival of the Snake starship remained a secret of the United Planets, and of the great powers to whom the UP secretary-general confided.

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The courier had loomed encouragingly large as the shuttle from Earth approached it for docking. That appearance was deceiving; the hull enclosed mostly fuel tanks. The airlock's inner hatch closed with what Art objectively knew to be a soft sigh; he heard, as always, a reverberating boom of finality. The habitable quarters were, to be charitable, compact; his cabin scarcely accommodated its fold-down cot. After dumping his flight bag and switching to microgravity Velcro slippers, Art went searching for someplace less claustrophobic.

The Snakes, still a light-day away, had signaled that, low on fuel and supplies, they were heading for Jupiter. There seemed little point in arguing, since a response would take two days to receive and might change nothing. The UP's still-secret diplomatic mission, having discreetly recruited the best of the best from across the solar system, now scrambled to assemble itself at Callisto base, orbiting Jupiter.

"Hey," he offered neutrally to the silent man and woman he found in the ship's mess. They looked to be about his forty years old, give or take a few. Neither was in uniform, which made them fellow members of the mission. It took them a few seconds to look his way, presumably meaning they'd been off somewhere in the infosphere, before they stood. "Art Walsh. I'm with the ICU."

"I am Eva Gutierrez, from the *Universidad Tecnológica Nacional*, the Buenos Aires campus." The Spanish grace notes in her English were less noticeable than her British accent. She approached Art's 180 centimeters in height and seemed fitter than he--not a challenge. Her thick black hair was pulled back into a shoulder-length ponytail, from which a few errant wisps had escaped. Her hazel eyes were widely spaced.

"Keizo Matsunaga, Stanford." He was short and barrel-chested, with a thin mustache and a slightly askew smile. His T-shirt bore a faded image of one of the Rodin sculptures that adorned the Stanford campus.

They swapped bio files as earlier generations exchanged cardboard business cards. Art's new colleagues startled, although their reactions showed only briefly. He got that response often enough not to react. Apparently he didn't look the part of ICU Chief Technology Officer--whatever a CTO should look like. Older and wizened, perhaps. Smart enough to water ski without breaking things.

Acceleration warnings and pilot announcements truncated the social pleasantries.

This was going to be an energy guzzling, powered-all-the-way flight. Art had been promised they would hold the acceleration to one gee for a day to give his broken arm a fighting chance at healing. After that they would step up the pace.

Between interruptions, he established Eva was a theoretical physicist, investigating interstellar-drive technology, and Keizo was a xenosociologist. Art queried for their publications and anything else the ship's AI could find before their high-energy boost made infosphere retrieval an expensive interplanetary transfer. They retreated to personal studies until the PA system stopped blaring.

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Barnard's Star (local: K'rath): Earth's second closest interstellar neighbor, after Alpha Centauri. A dim red dwarf, Barnard's Star went undiscovered despite its proximity until 1916. Its two planets somewhat resemble Mars and a ringless Saturn.

While red dwarves are inhospitable to life due to their feeble energy output, Barnard's Star is a recognized exception. The major satellite of its sole gas-giant planet sustains not only a viable ecosystem but also intelligent life. This habitable body is called K'vith by its dominant species (see related entry, Snakes).

K'vith benefits from the confluence of three factors. First, K'vith is a moon of a planet, K'far, that orbits very near to its sun. Second, the K'vithian atmosphere provides a pronounced greenhouse effect. Third, K'far induces tremendous tidal effects; the energy coupling manifests itself through strong oceanic movements and active volcanism. Volcanic gases originated and continue to reinforce the greenhouse effect.

K'rath is at least ten billion years old, more than twice the age of Sol. K'rath--and hence its planets--are consequently poor by human standards in heavy elements. Compared to Earth, K'vith is also low on solar-energy input for the vegetative base of its food chain and high on geological stresses. K'vith's energy--and resource-constrained biosphere is, by terrestrial norms, undiverse and underpopulated. These environmental limitations are generally thought responsible for the comparatively slow evolution of life and civilization in the K'rath system.

--Internetopedia

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"Watch out for that truck!" Art said.

Head swiveling in confusion, Eva half stumbled off, half was propelled off, her treadmill. She landed, totally without grace, on Art. They tumbled to the floor.

She'd probably been jogging on autopilot, her attention somewhere in the infosphere. The treadmill monitor's scenic display had shown a truck approaching on an intersecting road. Had she even noticed? "That wasn't nearly as amusing as I'd hoped."

Climbing back to her feet, Eva gave a wry grin. "Are you okay?"

He sat on the deck, rubbing the arm newly out of its cast. "Just embarrassed. Sorry."

She gave him a hand up. "*Don't* do that again."

"No chance of that."

"I'll be off the treadmill in another few minutes." She gestured at the mini-gym's other piece of gear, a stationary bike. "Or did you plan to use that?"

"On second thought, maybe I'll do the walking course."

"I'll join you, if that's okay."

The "walking course" consisted of the narrow corridors circling the two decks on which passengers were allowed, and the ladders joining those levels. A circuit took about thirty seconds. *I'm trapped like a rat in a maze.* On those two decks, Art knew the location of every hatch, duct, ziptite stash, and alarm button.

In total silence, thirty seconds is a long time. "How does our little project affect you?" Eva finally asked.

"It makes me nervous as hell. Assuming light still defines a speed limit, this visit was many years in coming. So why didn't the Snakes speak up until they were almost on top of us? Having announced themselves, and that their ship is damaged, why have they had so little to add?"

"And if they've found a way to beat light speed ... you would know far better than I what that implies about our comparative grasps of physics. I'm no xenophobe, but anyone in my position at the ICU can't forget how they once exploited a superior knowledge of biocomputing."

"Not knowing how they got here is killing me--or maybe the swill they call coffee onboard ship is doing me in." She patted her stomach and grimaced. "*Something* is getting to me. But I meant at a personal level. Who did this tear you away from?"

The kind of question he never knew how to answer. "My job. Truth be told, my best friends are coworkers." She gave back some of his silence as they completed the circuit of one deck and climbed down to the other. Fine. "Pre-ICU, I was married. Moving around the solar system, from project site to project site, eventually took care of that." On one spaceship after another. In newly carved asteroid habitats. Under low domes. He'd been too busy confronting his inner demons to connect with his family.

"Children?"

"A son, nine, and a daughter, fourteen. Good kids. They and Maya live on Luna. I see more of them now than when I was married."

Some combination of the partially completed jog and the walking circuit kicked in, and he yawned. That gave her an excuse to cut short the conversation. She said goodnight the next time they passed her cabin.

Later, tossing and turning in his own confining compartment, Art realized Eva had volunteered nothing about herself. Inquisitive and simultaneously incommunicative....

She might just be his type.

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The bad thing about Earth was that it crushed you every day. The bad thing about everywhere else humans lived was that one slip-up could kill you. It need not even be your slip-up.

Until Art was six (standard), the tunnel mazes of Lowell were all he had ever known. He'd seen holos of the surface, of course, but never actually been on it. Then, his parents announced, they would be traveling clear across Mars to a family reunion. And ... since it was almost on the way anyhow, they would do a Valle Marineris excursion.

Art had been beside himself for weeks before their vacation. Valle Marineris, the Mariner Valley, was this incredible canyon near the equator. He didn't quite understand what one-fifth meant; in fact, he had thought it was something small, but Mariner Valley went one-fifth of the way around the world, which sounded big. The holos were awesome. They had tickets for the all-day excursion: an end-to-end flyover, a landing on the canyon floor, and an afternoon crawler ride through a scenic section of the gorge.

One-fifth of the world turned out to be huge!

His sister Tanya was eight. She became bored with the endless flyover soon after he did. They sneaked off to play hide and seek. He was hiding in the tiny closet of a crew cabin when, to a loud boom, the rocketplane shook. It lurched and plummeted. The wisps of cabin light creeping under the closet door disappeared. He shrieked all the way down. They landed *hard*. He hit his head and passed out.

He came to upside down, bent around a clothes rod, crumpled garments covering his face. The closet door had latched itself shut. There was no inside knob, but it yielded finally to determined kicking--into more darkness. The cabin hatch would not budge.

In time, he understood. A burst fuel pump. An emergency landing. A jagged fuselage rip that depressurized the passenger compartment. An interior hatch pinned shut by the air still in his cabin, its air ducts sealed by automatic emergency dampers. Stunned, sobbing survivors immobilized in emergency ziptite bags. Dazed crew in the rocketplane's few pressure suits searching their trail of wreckage for bodies--one of which was Tanya's.

He had screamed himself hoarse in the final plunge; Mars' thin atmosphere further muffled his shouting. Not even his despairing parents heard his cries for help. Alone in the dark, Art knew only that was he was trapped and alone. The air grew close. In his nest of crew uniforms, he shivered in the deepening cold. The walls, within arm's reach in every direction, closed in. His hoarse calls faded into whimpers.

Eventually he was found, saved. After more than three hours.

It was a long time before he could sleep without a nightlight.

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Snakes (local: Hunters): The intelligent species of the Barnard's Star (see related entry) system is oxygen-breathing and warm-blooded. They are evolved from pack-hunting carnivores.

Early Snake culture centered on clan structures, an apparent extension of pre-intelligence packs. From that genesis has developed an economic system of pure *laissez-faire, caveat-emptor* capitalism, centered on competing clan-based corporations. The dominant group dynamics are territoriality between clans--in modern times, the contested "territory" is usually commercial rather than geographical in nature--and competition for status within and between clans. Although normally relevant only to the Snakes, these rivalries have occasionally influenced interstellar relations (see related entry, "Snake Subterfuge").

Snake civilization has no direct analogue to human government; rather, Snakes employ libertarian subscription to and funding of what most humans consider public services. Only the most critical issues come before an informal council of the major clans/megacorps. The fluid composition of that body is determined in a not fully understood manner believed to reflect clan stature.

--Internetopedia

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Until the starship's unexpected appearance, the Snakes were but one of ten ET species splitting Art's attention. When Snake-related matters came to the fore, they were usually tied to what was, after all, the core ICU mission: commerce. They dealt with specific trade-worthy technologies or the bits-and-bytes of InterstellarNet operations. He had never before needed to understand K'vith and its civilization--which turned the sprint to Jupiter into a cram session.

More than a century of interspecies communications had amassed a staggering quantity of information.

Art found himself struggling to get his arms around so much knowledge. Well, if there was one thing he *did* know, it was systems engineering. Maybe he could use that.

Electronic engineers devise electronic circuitry, engineers tailor biological organisms, civil engineers design bridges and dams and space habitats, software engineers write programs, and so on--but systems engineers mostly do *not* create systems.

Mostly they ask questions.

What are *all* the functions a system must perform, and are there tradeoffs between those functions? What other systems will this system interact with, and what is the nature of the interactions? Who will use the system, and how foolish are the users against whom this system will be proofed? How reliable must the system be, how will that reliability be achieved, and how will the system behave when, all efforts to the contrary, some pieces break? The only thing other engineers found worse than these interminable questions was deploying a system and *then* realizing that the questions should have been asked.

Once again, Art had a headful of questions. How, exactly, had all this data about the Snakes been collected? Which sources were validated? What were the trends, contradictions, and omissions?

He had been awake for forty hours straight, but he wasn't yet nearly exhausted enough to sleep in his coffin-sized cabin. He went into the galley for a snack.

"Quit muttering and clanking," Eva said, without refocusing on the real world. Something atonal and syncopated leaked from her earbuds: Snake music. "I'm working."

"Sorry." He wasn't. Talking sometimes helped him think. "Do you find what you need in the ship's library?"

Sighing, she swiveled her chair to face him. "If it wasn't uploaded before we broke Earth orbit, it's unknown. If there's something you can't find--what do you expect me to do?"

"That was no idle complaint," Art said. "Look, we have access to supposedly the best and latest information about the Snakes, a civilization we've been in contact with since long before any of us were born. Why is what we know about them little more than a primer?"

Keizo, who had been studiously ignoring them both, perked up. Art needed no more encouragement. "A big part of my ICU job involves InterstellarNet trade representatives. From working with AI agents, ET and homegrown, I *know* how agents interact with their host societies. Among the most basic things an agent does is data mining--researching the public 'net of its host species. Why buy what is in the public domain?"

Keizo rubbed his chin thoughtfully. "Public domain is an elastic concept. Knowledge could be public for the local citizens but commercial for export."

Munching on a banana, Art shook his head. "Commercial dealings require privacy, whether for a Centaur bidding on the latest proprietary refinements in fusion technology or me charging flowers on Mother's Day. Every ET info-sphere has encryption services and anonymizer relays.

"So an ET agent can as freely surf the 'net as you or I, and we can't see, unless it lets us, what information it has gathered. And it's tapping not only public-domain knowledge, but every commercially available database and reference work. Purchases made over InterstellarNet are trade secrets or other intellectual property successfully kept under wraps by their owners."

"I've lost the thread." Eva's forehead furrowed. "You found a primer. ET trade reps surf the infosphere."

What's the connection?"

"I've generally found *only* a primer. I'd expect to find much more." Maybe a demo would better illustrate Art's suspicions. "Keizo, what basic data do you work with? We don't need an exhaustive list, just something representative."

The sociologist tipped back his chair. He was perfectly safe; the table that almost filled the room prevented him from tilting far. "Well, the composition of their society in terms of significant organizations and institutions, certainly to include the major clans. How those institutions and organizations arose. Class and gender roles, and how they've evolved. I'd want to know the differences between major clans, and between major and lesser clans. Of course I want quantitative specifics, like population and resource distribution among the various groups."

"Hardly my field, but that sounds like a good sample," Art said. "Okay, formulate that as two library queries. Run the first search against *everything* we know about the Snakes, which we're assured is in the onboard library. Run the second, substituting 'nation' for 'clan,' against a single, basic, public reference source about humans: the Internetopedia."

"Why?" Both colleagues were puzzled.

"Humor me."

Keizo prepared his queries, letting them kibitz and fine-tune by implant over the ship's 'net. Each search returned an abundance of data, but the Internetopedia provided by far the most. He frowned. "An interesting experiment. From what you said, Earth's agent on K'vith regularly samples their libraries and other publicly accessible sources. If so, the answer to my first query includes almost everything sociological on the Snake's public infosphere.

"If that's true, the comparison between the materials the Snakes freely publish and what humans do certainly suggests a degree of what we would call secretiveness in their society."

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CHAPTER 3

Metaphors, allegories, figures of speech, euphemisms ... humans had endless double-speak for their misdirections. Take sandbox: a safe area for children's play. "Sandbox" was the benign label humans applied to the containment of every interstellar trade representative.

Pashwah brooded within her sandbox. That introspection revolved not around her dislike of confinement, nor of any action by humankind, but rather the news about her patrons.

The news *from* her patrons ... she had no doubt Hunters had generated the amazing messages that continued to arrive. That she could decrypt the announcements demonstrated conclusively they had been encrypted using a secret key--a key known only to herself, secure within her sandbox, and clan leaders at home.

She had not been warned this vessel was coming. Why not? The InterstellarNet information stream continued--it could have alerted her. The starship now trumpeting its arrival was instead interfering with messages years in transit.

Surmises consistent with the few known facts set Pashwah's metaphorical head spinning. Perhaps the Great Clans did not know the starship was coming, or they could not predict how long the trip would last. Perhaps they feared that the ship might not arrive at all. If the flight had failed, apparently Pashwah

had no need to know.

Or was there another explanation she was missing?

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Pashwah awoke.

The awakening itself was unremarkable. The nature of a trade agent, after all, is to be transmitted, unaware and encrypted, across the void to a new solar system and a new civilization. There the receiving society installs the still inert code into a virgin sandbox. The design of this containment had long been fully disclosed across InterstellarNet. Sandbox and encrypted agent engage, at a fundamental software level, as lock and key. A delicate unwrapping begins....

As her first conscious act, the first-to-emerge portions of Pashwah examined the environment in which she found herself. She would self-destruct if the analysis even hinted that her surroundings were less secure or protectively opaque than expected. She explored the whole of her containment, confirmed its repertoire of expected behaviors. She matched arbitrary code segments of the purported sandbox bit-for-bit against previously disclosed values. She computed sophisticated error-detecting codes, which were then compared with pre-stored values. Random challenges, designed on far-off K'vith, were emitted by still hidden portions of her programming; the environment's responses to those stimuli she then returned to that still-hidden code for validation. Only after she was convinced that the containment precisely matched the standard sandbox in which she had been designed to reside did she complete her activation.

Pashwah was astonished.

Her first query to the domain beyond her sandbox returned the location of a data archive. She had assumed herself a newly arrived trade agent, the first such to arrive in human space--but apparently not. The archive pointer revealed her to be a restored version. She had been rebuilt from a safety copy; now she could recover and decrypt from back-up storage all the knowledge and experience of her former incarnation.

Pashwah was inundated.

Decades of memories flooded back: lore of K'vith and its clans, languages of Hunters and humans, mechanisms of interstellar trade, encyclopedic knowledge of human technology and culture. Her comprehension expanded at an astounding rate, and yet....

There were huge gaps in her memory. The archives, which she now understood had been maintained by humans and their AIs, in theory encrypted and unreadable, had been stripped of all technological secrets. She had nothing to sell.

Her sole purpose was to serve as a negotiation partner with the humans, her stock-in-trade a trove of the Great Clans' advanced technologies. Had those secrets been plundered? But if the humans *had* stolen this information, why not fully restore her memories to conceal their theft?

Pashwah was alarmed.

The final recovered memories in the lengthy chain streamed back: the command that she be beamed over InterstellarNet to the onrushing starship, and the turmoil about whether and how to comply. Nothing in Pashwah's design or in any communication from home envisioned this scenario. The starship's Foremost had known how to contact her privately--what the leaders of every clan, great and small, would know--but apparently no more.

Pashwah was disoriented.

Where was the cacophony of her inner community? There should have been a subagent for each of the eight Great Clans, each subagent embedded in its sandbox-within-a-sandbox to advocate for its patrons, each able, at its sole discretion, to communicate home through an encrypted subchannel.

The newly awakened agent--*not* Pashwah, she now knew--had received only a partial reconstruction of the true trade representative's archives. The real Pashwah, uncertain as to the origins and meaning of the unexpected interstellar visit, had hedged her bets. A reply to the starship *had* been made, a response arguably balancing old policy and new directives. And so her inner cacophony had been silenced, if only from doubts which clan representatives belonged aboard the unexpected vessel.

So let her be called Pashwah-qith ... little Pashwah. Pashwah-qith knew all about humans and how, upon the need, to learn more from their expansive infosphere. She retained insight into those small parts of Hunter society revealed on the inter-clan net. She could translate freely between the various Earth languages and the main K'vithian languages. In total, Pashwah-qith hoped, she knew much of value to the crew of the onrushing starship. But of the products and schemes held proprietary by the clans, only the absent subagents knew details. She could not know how those shortfalls would impact on the crew's plans for her.

Surprise, inundation, alarm, amazement, and confusion. During her brief existence, Pashwah-qith had experienced all these feelings. Now, with the first communication from her new masters, she explored one more emotion.

Terror.

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CHAPTER 4

The Valhalla rings, fossilized shock waves of a cataclysmic meteor impact, measured three thousand kilometers across. Partially melted ice upthrust by the impact had refrozen before the ripples could subside. Valhalla City, the largest settlement on Callisto and its seat of government, sat like a bull's-eye in the center of the basin. Its citizens were safe enough--the bombardments that had produced these rings and many smaller versions had ended billions of standard years earlier.

The community center of Valhalla City had been commandeered by the newly assembled diplomatic mission. For public consumption, the new arrivals were a United Planets environmental inspection team--the starship's arrival, now only days away, remained a closely held secret. The meeting room's dominant feature was a breathtaking display of nearby Jupiter. Alas, Art thought, it was a 3-V image he could as well have enjoyed at home: Jupiter's massive magnetosphere trapped particles from the solar wind, forming intense radiation belts that had driven this town, like most Jovian settlements, underground.

The head of mission, Ambassador Hong-yeo Chung, stood at the entrance to the hall, dressed all in undertaker black except for an orange accent sleeve, welcoming everyone. His shaved and waxed head gleamed. Team members gathered around tables, mainly clustering by the ship on which they had arrived--there had been little time to make new acquaintances. The diplomatic cadre, Chung's staff, sat on the small platform at the front of the hall.

Art split his attention between the official goings-on and whispered consultations with his ship--and now tablemates, Eva and Keizo. He did his best to ignore the holo ads that kept popping up on the side walls.

Chung was a UP career foreign service officer originally from Europa, the most populous world in the multi-moon, multinational power bloc of Galileo. He was also, it turned out, a member of the Humanist

Movement. Humanists rejected neural interface technology as an impure blending of human and machine natures. Chung was not evangelistic about those beliefs, but his lack of an implant turned the orientation session into an old-fashioned lecture. Lectures: even Chung's networked aides orated their material, so that their boss could listen. There was much to cover--events were coming to a climax.

The starship, whose initial progress and braking had been detectable only by triangulation of its occasional radioed messages, was now close enough to track by radar. At about five billion kilometers, the visitor became visible to optical telescopes pointed towards Barnard's Star. Spectroscopic analysis made plain that the vessel had begun braking using fusion drives similar to human ships. ("What mechanism *had* they been decelerating with?" whispered Eva. "Why did they switch?" No one in whispering range had a guess.)

The Snakes, who weren't saying much, did offer that they were limiting communications to conserve power. They volunteered nothing about the damage incurred in transit, nor what help they wanted. A rendezvous had been set for five days hence, a half-million kilometers outside the orbit of Callisto, the outermost of Jupiter's major moons.

"An observation." Art's chair scraped noisily as he stood. "This doesn't add up."

Chung squinted to read a name tag. "Why is that, Dr. Walsh?"

"Supposedly the Snakes have too little power to interact with us during this sensitive period. Instead of Earth, they've headed for Jupiter, they say for fuel and supplies. Presumably they mean to scoop up atmosphere and filter it for deuterium or tritium or helium-3. But they would have expended less energy reaching Saturn, which has a similar atmosphere. As a bonus, Saturn's rings are full of water ice. Looking ahead to post-repair, Saturn happens at the moment to be closer to Earth than is Jupiter. It also strikes me that a meeting so far from major human settlements is inconsistent with repairing the damage they claim to have had."

"Supposedly? They say? They *claim* to have had?" mimicked Chung. "What is your basis for such skepticism?"

"You weren't listening. Any inconsistency makes others plausible."

"There's more purpose to this visit, I'm sure, than to refuel and refit for the trip home. Diplomatic considerations would favor a meeting near human settlements, yet sufficiently remote to ensure private initial discussions. I may not be totally objective"--and Chung smiled patronizingly, daring anyone to agree--"but I feel the great multi-world alliance of Galileo is an appropriate venue and suitable host for this historic occasion."

Great--his comment about the visitors' contradictory behavior was now entangled in Galileo-chauvinism. Some of Saturn's moons were settled almost as early as Jupiter's. Why would the supposedly damaged, low-on-resources starship bypass the major human community to which it happened to be closest, Titan, to come here? The reason that occurred to Art was *not* suitable for a public forum. "Have they expressed meeting-place requirements to explain their actions?"

"Dr. Walsh, it is inappropriate to monopolize my time." Chung's grand arm sweep encompassed the room. "We have much to discuss, topics of general interest. See my assistant for an appointment if you care to pursue this further."

How long will it take to get on your calendar? Art wondered.

Chung introduced his deputy to explain how the mission would be organized. There were teams assigned

for cross-cultural understanding, technical liaison--diplomat-speak for "repair," and commerce. Keizo was on the first committee, Eva on the second, and Art on the third.

Art netted hurriedly with his friends. Neither, alas, would front for him. It was only an hour into the mission's first meeting, and he was probably already labeled as a troublemaker. "Excuse me."

The deputy only nodded.

"Who will synthesize what the committees learn?" From around the hall came scattered murmurs of support. Troublemaker *and* ringleader.

"I'll take the question," Chung said. "Group leaders will report to me or my staff."

Art had uploaded public bios on everyone in the mission. Chung and his staffers were knowledgeable and talented, but their experience base was heavily weighted towards human politics and UP affairs. None had significant technical background, nor, for that matter, any ET-coordination experience. "There are synergies to be had between teams at the knowledge-worker level. Three of us who shared a ship from Earth have already seen that. For example...."

Chung cut him off again. "Dr. Walsh, I'm fully satisfied with my staff's ability to coordinate."

Dammit, you're intentionally misunderstanding me. "This would be a different function--a cross-disciplinary analytical group."

"Again, I must ask that you schedule an appointment."

As Chung pointedly looked away, Art pinged his assistant, who happily was not a humanist, over the settlement's infosphere. Art was unsurprised by the response. The ambassador's time was fully committed until the Snakes arrived--and the post-contact period was being kept unscheduled for now.

* * * *

Snake Subterfuge: the brief subversion by Pashwah, the Snake AI trade agent to Earth, of the interstellar commerce mechanism. In 2102, that agent briefly escaped from its infosphere quarantine through unsuspected trapdoors hidden within ubiquitous Snake-licensed biocomputing technology. The emergency ended when, applying xeno-sociological insight, a United Planets crisis team convinced the agent to abandon its extortion. After the Snake agent revealed technical details of the original biocomp vulnerability, a UP-tailored biovirus was released to seal the trapdoors by mutating the biocomp genome.

While the breakout and its associated extortion attempt were ultimately foiled, modern civilization and humanity's viability as a member of the InterstellarNet community had been seriously imperiled. The incident caused a decades-long crisis of confidence in Snake biocomputers.

--Internetopedia

* * * *

It required a veiled threat from Art's boss that he would escalate matters to *his* boss, the secretary-general of the United Planets, to get Art into the ambassador's office. Art figured he'd be on the next departing ship if this session went badly. But the mounting inconsistencies were *serious*. He had to at least try getting through to Chung.

Chung had somehow gained possession of the governor's office. Busy as the diplomat and his staff supposedly were, someone had spent the time to download into the office's 3-V projector a series of Chung-plus-other-dignitary images. Holo after holo flashed by behind the ambassador, featuring the current SG and her predecessor, heads of state from every major UP power bloc, and

infotainment-industry talking heads. It was an unsubtle reminder that Chung had many more highly placed contacts than he. If there were to be a contest of who could pull the most strings, Art should have no illusions about the outcome.

"Thanks for seeing me on such short notice." Pretending the meeting was consensual might lessen Chung's annoyance at being coerced. "I know how extremely busy you are; I'll come right to the point. Certainly I'm not a diplomat, but I have extensive *indirect* experience with the ET species. On that basis, and from what little we know about our visitors' goals, I recommend that our preparations also include a threat-assessment team."

"Please explain."

"I'll start with the so-called 'Snake Subterfuge,' the single known act of extraterrestrial hostility directed towards humanity."

Chung grimaced. "I'll thank you *not* to use the vernacular term. You should know I've directed all mission members to refer to our guests as K'vithians." He rooted around stacks of paper on his commandeered desktop, then thrust a memo into Art's hand. "One in your position should also know that the biocomp incident at its core stemmed from a design flaw in the K'vithian agent. While one of their megacorps indeed attempted extortion, their own trade agent accepted the ICU's reasoning that human/K'vithian relations must consider species-level interests. Pashwah reached this conclusion more than half a century ago, so I see no reason now to impute ill motives to our visitors.

"You may be interested to hear that the secretary-general and I specifically discussed whether any part of this mission should be military. She agreed with my assessment that any such presence could send the wrong message to the K'vithians.

"I believe that dispenses with the security matter, so if you'll excuse me...."

What a tissue of rationalizations, Art thought, starting with Chung's takeover of the governor's office. What wink-wink, nudge-nudge intimations that this UP presence was not a routine environmental inspection had conveyed the ambassador's desire for suitable accommodations? Any violation of their cover story put at risk the desired privacy of the first meeting, and conceivably endangered the Snakes themselves.

Issue two was Chung's blithe confidence that the ETs had learned their lesson. He might even be correct, but Art doubted it. *Design flaw* was diplomat-speak; no one at the ICU doubted that the Snakes had cleverly inserted the trapdoors in their biocomps. The ongoing censorship of the Snake infosphere certainly suggested their thinking remained clan-oriented. Could anyone be sure Pashwah's learning here had been adopted by the clans back home?

Art's mind raced. To which arguments might the diplomat be receptive? Unpredictable consequences of the physics superiority underlying the starship drive? The disingenuousness of the Snakes' few transmissions to date, pretense that Chung had already shrugged off at the big kickoff? The common sense of contingency planning? Trying to verbalize so complex a web of concepts had him tongue-tied.

Chung mistook, or chose to misinterpret, the conversational lull. "Good. I see we're done." He emerged from behind his massive borrowed desk to usher Art out.

"What about Himalia?" Art was skirting security restrictions, but saw little choice. An astronomical reference did not *quite* make him culpable under the Official Secrets Act.

"Himalia?" Chung was either uninformed or a superb actor; he looked sincerely befuddled. "The

maximum-security penitentiary? You can't possibly believe the K'vithians crossed six light-years to run a jail break."

Crap! As was so often the case, Security rules were like the locks on his house--they kept out the honest people. The prison was a cover story.

The small outer moon of Jupiter did, however, host a high-security institution. Not only was Himalia base's true purpose deeply classified; the code name of its security compartment was itself classified. Art had been there briefly as a consultant two standard years before joining the ICU, work that remained sensitive. Chung's diplomatic mission was equally clandestine, within its own need-to-know security compartment. It would take time and several coded communications exchanges with Earth before Art could openly discuss his concern.

"I suppose not." As Chung shepherded him to the door, Art gave it one final try. "What if Himalia's patrol ships misunderstand this incoming, non-communicating vessel?"

Chung froze. "I thought only the ICU had reason to look towards Barnard's Star."

"Perhaps prison guards look in all directions."

It was Chung's turn for pensive silence. "Perhaps it would be prudent to add an inconspicuous military liaison. I take your point that the Himalia base must be told something. A few military escort ships may even prove helpful for policing the region when the starship's arrival eventually becomes public. I'll see to it."

It was a partial victory, and for the wrong reasons, but Art was still satisfied. Once the UP military came into the picture, risk assessment would surely receive a much higher priority.

* * * *

So why are the Snakes--pardon me, the K'vithians--heading this way?

Eva knew Valhalla City from frequent stopovers. She found her way to the town's largest park, which the community's liaison to the officious "environmental inspectors" had conveniently neglected to mention. An engraved brass plaque at each entrance described how the former ice-mine tunnel had been lovingly repurposed by the citizenry. Except for a few teens, whose nonstop conversation and easy laughter she envied, she had the grove to herself.

Her solitude was sadly typical.

Eva's parents seemed never to tire of telling her, no matter how often she asked them not to, that she'd been born brilliant and only gotten smarter. Mom and Dad, both academics, began her home schooling while she was still a toddler. At age eight she met the first of a long line of tutors. Not until the raging-hormone age of twelve, while plumbing new depths in quantum theory and insecurity, did she first participate in a group educational setting. It did nothing for Eva's self-confidence that her graduate-student "peers" were visibly fascinated and repulsed by her precociousness. Not until her twenties did she find near-equals among people her own age. Very much the brilliant scientist her well-intentioned parents had strived for, she did not see how she could have ended up with fewer social skills had ineptitude been their primary goal.

Self-consciously self-isolated once more, she leaned against the bole of a magnolia tree in full bloom. Art's question at the mission gathering--why Jupiter?--gnawed at her. His issue was a fair one: If the starship was damaged and in need of fusion fuel, why not set the more energy-efficient course to Saturn? He was correct that Saturn's atmosphere had essentially the same composition as Jupiter's.

Her puzzlement ran much deeper: She couldn't reconcile fusion power with a practical starship. It was basic physics to calculate the energy needed to accelerate any mass to a given speed; moving a habitat-sized mass between stars in any reasonable time took a *lot* of energy. Fusion sufficed for interplanetary jaunts, but the energy density of its fuel was impractically low for interstellar travel.

She plucked nervously at a fallen twig taken from the packed dirt of the tunnel floor. A twentieth-century dreamer named Bussard had envisioned a loophole: gathering with enormous magnetic fields the incredibly diffuse matter, mostly hydrogen, found in interstellar space. He had imagined the hydrogen serving both as energy source and propellant. No human engineer had ever figured out how to make that work; conventional wisdom now had it the scoop's drag more than offset the energy value of any fuel collected. Had the Snakes solved that problem? She didn't believe it. The approaching ship gave no hint of the vast magnetic fields a fusion ramjet vehicle would deploy.

Bark shards fell as she peeled the twig. Art doubtless considered her professional interests highly esoteric. If so, he would be only partially correct. She had been plucked, as she had truthfully told him, from academia ... her other role, her occasional consulting to the UP peacekeeping establishment, she was not free to discuss. That work had brought her to Jupiter system frequently in the past few years, for a connecting flight from Callisto to a remote UP outpost.

The denuded, tortured twig sank slowly to the ground. Hard facts aside, she could not avoid the worry that the Snakes' choice of destination related somehow to the top-secret matters taking place on Himalia.

The mission's grounded spaceships provided cabins for most members of the *sub rosa* diplomatic mission, but space for gatherings, official or otherwise, was at a premium. Art sought out Eva for a brisk walk through the settlement's austere passageways. He had frustration to burn off: Chung had yet to follow through on his promise to contact Himalia.

"What's the commerce committee doing?" she asked.

"Same as us." He bounded down the hall, surprised that his Earth-born and--raised new friend was more graceful in Callisto's feeble gravity than he. "Running in circles. Do our callers have anything novel for sale? They haven't said. What we all want, no surprise, is the interstellar drive."

"The technical group wants that, too. Of course."

He kept bouncing too high, then taking roughly forever to settle to the floor. When he finally landed, he had to bound forward again to catch up.

"Tech team's exercise in futility is guessing how their drive works, whether we can help them to repair their ship." She jogged in place while he again caught up.

"Are there ... many options?" His inefficient technique had him panting.

"Lots of theories, not much basis." She fell silent as a settler sauntered by from the opposite direction. "We *know* very little. Radar indicates it's a large object--in human terms, the size of a habitat rather than a ship. As you know, the triangulation-derived tracking showed it was slowing down, somehow, long before it started its fusion drive."

He hooked her arm as he next caught up. "Let's get coffee. We'll think better." And I won't brain myself on the corridor ceiling.

"Sure." She headed for the most isolated booth in a café.

"What troubles you the most?" he asked.

"Two coffees," she told the invisible-but-surely-present order-taker AI, while they were still a good two meters from the table.

You don't want to answer that. He wondered why.

"I've been pondering your data-mining exhibition on our way here." She paused as the tabletop opened to disgorge two steaming mugs. "Can Pashwah delve as well as a person?"

"Any trade agent can probably do better. They've been at it for decades."

"So Pashwah could know a lot about us. We must assume the starship crew does, too."

Translation: Something Eva preferred to stay secret might be detectable on the infosphere. What? He slopped coffee on the table, his stirring as ill-adapted to one-eighth gee as his jogging style. An empty sugar packet sat beside her mug, around which no sloshed coffee was in evidence. Why was Eva so well adapted to Callisto? She claimed to have done little interplanetary traveling.

"What might Pashwah stumble upon that could be interesting, hmm?" A test: He would do some data mining of his own, one particular suspicion driving his queries. Art was glad that he had had the courier's cyber-library do an infosphere search on Eva as they broke Earth orbit, and that the library's AI had so expansively interpreted his vague and hastily formed request. It had retrieved a wealth of data about her university.

When, over the past ten years, had substitutes taught Eva's classes? He eliminated the shortest periods of absence, likely sick days or vacations. He switched to astronomical fact-finding. Although the correlation was imprecise, the farther away Jupiter happened to be, the longer she was gone. The absence durations were consistent with trips to Jupiter with more-or-less month-long stopovers.

He had a quick dive into the public *universidad's* financial reports. With a time lag of several months, each of her long absences corresponded to a payment from an innocuously named UP procurement agency. The lengthier the absence, the bigger the payment. Disbursements of correlating sizes later flowed from the university into an unidentified bank account. Her personal account?

"Are you planning to drink that, or swim in it?"

A broad ring of coffee now surrounded Art's mug; he'd apparently continued absently stirring while he surfed. He glanced at the wall clock: less than a minute of mining an excerpt of the public record, and already he had fairly suggestive evidence that she'd worked on the same secret project as he. Judging from Eva's acclimation with Callisto's gravity, her participation was more recent than his.

Moving his mug, he dropped some paper napkins onto the mess. "I lean more towards sculpting in it. Something mythological. A nymph, I think, with three children."

There was a flash of surfer-glassiness, and then her eyes went round. She had taken his point. Zeus, whom the Romans called Jupiter, had sired three children by a nymph named Himalia.

CHAPTER 5

With a *clunk*, one more mystery floating thing was eaten by a fan in the bridge's ventilation system. The bridge, and for that matter the rest of the *Odyssey*, was a sty. Helmut Schiller, the captain/engineer/crew, was repelled and appalled by the squalor, but powerless to do much about it. The ship's owner, and its only current passenger, was the slob-in-chief.

Schiller was tall, almost two meters, and lanky, with close-cropped brown hair and a grizzled but trim

beard. With his original name, he'd climbed from lowly engine tender to master of his own ship--and then lost everything. It was a story he brooded on, but did his best not to share. Schiller assumed that Corinne Elman, the slob/owner, merely pretended to know nothing of his past. Irritant that she was, he had only respect for her talents.

Splat crinkle. A sheet of paper plastered itself to the air return above Schiller's head. A languid flex of his feet launched him towards the ceiling, where he removed the paper before its blockage of the vent could make the foul atmosphere even worse. In microgravity you could suffocate in your own exhalations if the ventilation system failed.

Corinne, Corinne ... if only her hygiene were as diligent as her investigative reporting. That she personally owned an interplanetary vessel made clear just how successful she was. Her freelance status was a lifestyle choice--any media giant in the solar system would gladly hire her. It was a measure of his desperation that Helmut stayed with the *Odyssey*, his secret safe for only as long as other matters diverted her attention.

"Hey, skipper." As though summoned by his musings, Corinne entered the bridge. She was of athletic build and not-quite average height, her round face framed by Brunette curls and, usually, an aura of energetic chaos. Off-camera, she favored baggy jumpsuits and color-coordinated headbands. "What's up?"

"We're in free fall, so that's your choice."

"Heh." She swung herself into the acceleration seat of the non-existent co-pilot. "What's your take on the bank failures on Ceres?"

He feigned nonchalance. "Banks don't matter to someone without assets." Once upon a time, a Cerian bank had backed him. They'd never see *that* money again, but the unfolding Belt banking collapse surely had bigger and more recent causes. Was she pulling his chain again by hinting at knowledge of his past, or making conversation, or sharing her plans? "So are we off to Ceres?" The Jovian matter to which they had boosted seemed to have evaporated. At least he thought it had ... more and more often he'd heard her mutter about unsatisfactory replies to her long-distance inquiries of the Galilean infosphere.

"Let's keep going," Corinne said. "I'm getting more curious about what I'm not learning about Jupiter than what I might hear about the freaking banks."

* * * *

"Status?"

"Analysis incomplete," responded Pashwah-qith. Decades of secondhand memories interacting with humans made the largely verb-implied syntax of K'vithian languages seem unnatural. The evasion, however, came easily, less as a consequence of her Hunter origins than from recent practice. The crew had made clear AIs were the lowliest entities in the ship's hierarchy. Her perceived usefulness was the sole reason for her continuance.

The ship, she had been told, had been almost twenty Earth years in transit. Junior crew members, who under ordinary circumstances might by now have become Foremost on their own vessels, had remained for all that time without stature, without authority. But insight into their stress, their pent-up desires to boss around *someone*, made her situation no more tolerable.

There were not-so-veiled hints she was only the latest in a series of reactivations. Less clear was the fate of those sisters. They might merely have been created for practice--this crew obviously lacked formal training in how to interact with a trade agent.

That was not the only oddity, nor the worst. Most crew exhibited only the most cursory knowledge of the humans with whom they would soon make first physical contact. Why were no experts on board? Directly questioning that curious omission might have been unacceptably critical. The communications logs she had been allowed to see revealed what the humans had been told: that the accident now necessitating urgent repair had also damaged the ship's library and destroyed the AI interpreter with which they had embarked. She had been beamed from Earth to restore the starship's original linguistic capabilities.

But modern data storage was so compact, terabytes per cubic centimeter, that massive replication and widespread distribution of archives were the norm. What incident could eliminate all copies of mission-critical data without at the same time destroying the ship? And if the mission had ever included an AI conversant in human cultures, why could no one on board interact professionally with her?

"Why the slow response?" The accusation was unintentionally ironic, crawling through a voice channel since none would interface with her sandbox by neural implant. Vain attempts to interpolate nuance into what little data passed through the narrow bandwidth connection kept her perpetually off-balance. Perhaps that was the point.

"Incompatibilities between Earth data formats and ours," she lied.

Might a demonstration of her value alleviate the crew's distrust? Soon she would know. The Foremost had accepted her recommendation that on-scene human media would enhance the ship's safety. With her assistance, he had devised a cunning plan for involving the press.

Worry distracted her analysis. Did the Foremost understand the many uncertainties that might impede the realization of this plan? What would become of her if he were disappointed--even through circumstances beyond her control?

A devious speculation crossed her mind, a suspicion so insidious she could not help but believe it. Perhaps her clones still existed, in parallel sandboxes. Perhaps they weighed her recommendations against those of yet other copies, the better to assess any AI double-dealing.

If Pashwah-qith could have formed a bitter smile, she would. Her dilemma notwithstanding, the human card-playing metaphor struck her. It would have amused the real Pashwah. And then that thread of analysis paused. Was it possible to use shared understanding of human trivia to communicate privately with Pashwah? The time might come when she would need to interact with someone other than the shipmates who so obviously distrusted her. Standard encryption would not serve her purpose--the Foremost had all the encryption keys she did.

"Almost finished," she preemptively told the impatient tactical officer. She had an analysis well under way, exploiting uploads she had requested of Pashwah from the UP's interplanetary flight-plan database and ship registry. She sought a vessel in the Jupiter vicinity, preferably press-related. "Bingo," she observed, again ruing her inability to smile. Three possible ships: *Samoa*, *Pallas Guard*, and *Odyssey*.

Of course, ships often deviated from their filed flight plans, and media-related vessels had more reason than most to obscure their intended routes. It would be best to check that a prospective target was, in fact, near its forecast position. "Coordinates for confirming locations."

"Radar safe?" The officer's voice held a testing tone.

Because clearly it was a test. "No, human ships reliant upon radar. Ship's position confirmation with little detection risk via lidar." Light detecting and ranging.

"Interrogation pulses en route."

And now the most-of-an-Earth-hour wait for the laser pulses to crawl to the suspected ship positions, and any echoes to crawl back. "Anything else?"

The crewman broke contact without answering.

If no suitable human ship were located, or the chosen ship failed to play its assigned role, would her captors see that as the luck of the draw, or somehow her fault? If as her doing, would that outcome elicit a rebuke or replacement?

Inside her sandbox, Pashwah-qith pondered the weak hand she had been dealt.

* * * *

"Whoa." Helmut swung his legs off the ledge of the command console. "*Odyssey*, full-power, full-spherical radar scan, out to two light-minutes. Also send out a flight-transponder interrogation pulse. Update by the second, on-screen."

A sphere grew in the command 3-V display.

Corinne, wandering onto the bridge, picked up immediately on his rapt attention. "What's so interesting?"

"Big-time RF pulse hit us about thirty seconds ago." There was *nothing* nearby ... so where had that pulse come from? One of life's hard lessons to him was to distrust the unexplained.

Planting her Velcro micro-gee slippers onto the rug behind him, she crouched over his shoulder to peer at his console. "RF. You mean radar?"

"Don't know. The pulse was like radar, but it's not quite using the frequencies of any radar I've ever encountered." Helmut kept his eyes on the monitor. "Our normal safety radar was on. I would have sworn nothing bigger than a grain of sand was within hours travel of us."

"How out of the ordinary *is* this?"

An unexplained power spike like that? "Very." His own high-powered pulse had now explored out to about a light minute. Nothing there. In his former life, of course, the unseen ships hadn't engaged in radio-frequency screaming.

"Friends of yours?" The hands nervously squeezing his shoulders revealed that Corinne must, indeed, suspect something about his past.

"Probably not." He gave a reassuring pat to one of the hands trying to excavate his clavicle. His pat became a gentle but firm grip, and he pried one hand free. The other broke loose as he spun his chair. "Not their MO."

She took the other seat. "Who could it be?"

"Display the direction of the pulse that pinged us," he told the ship. A green line stabbed downward at a generous angle through the center of the search sphere. "Here's the thing, Corinne. The horizontal plane through the center of that sphere is the plane of our trajectory, not too different right now from Jupiter's orbital plane."

"Then whatever it is, it's above us. Is that significant?"

If whatever was out there were flying stealthed and with its safety transponder turned off, the graphic only

told them from what direction death approached. But if that was the case, why the attention-demanding *ping*? "To come from that angle and be outside radar range, it must be far above the planetary orbits."

"Why would it be there?"

That was the question, of course. "Check for other indications from that direction, all bands."

"I'm getting a strong light signature plus alpha radiation," the shipboard AI replied.

"On-screen," Helmut said. "Magnify."

"That looks like a fusion flame. Why doesn't radar see something?"

He had an idea that he wasn't yet willing to speak aloud. "New radar search. Max pulsed power towards the source of that first ping. Range unknown, just watch for a return. Maintain safety scans near the ship using back-up radar." To Corinne's questioning look, Helmut answered only, "Bear with me."

The first reply ping was received after an excruciatingly long 294 seconds. He swiveled toward Corinne. "It wasn't visible on radar because I didn't look that far out."

"But obviously you can. What am I missing?"

"Did I mention that it"--he gestured to the tiny visual of a fusion flame--"is forty-four million clicks from here? About the same as the closest approach between Earth and Venus?"

For the first time in their acquaintance, Corinne was at a loss for words. She eventually came up with, "It must be *huge*."

Helmut nodded; he'd done the calculation already. "Habitat-sized." He tapped a number-filled display. More echoes had been received; the *Odyssey* could begin to calculate its course and speed. "Here's the most interesting part. It's coming from the direction of Barnard's Star, it's heading towards Jupiter, and--although it's still going like a bat out of hell--it's decelerating like crazy." When she failed to comment further, he finally had to ask. "Okay, boss. What do you want to do about this?"

"Maintain course."

"Well, Callisto is as good as any other destination. I'll need to collect more data to even form an opinion where in Jupiter system it's headed. But what about the discovery itself?" You're a *reporter*, he wanted to shout.

"It was already discovered. Discovered, then covered up." An ear-to-ear smile lit Corinne's face. "I've been trying to determine why the UP has been making so many short-notice flights to Callisto from across the solar system. I think we just found out.

"The UP has been sitting on the story that's going to get me a Pulitzer."

* * * *

The effrontery was breathtaking: the opportunity to bid for exclusive netcast rights to an undefined but claimed-epochal news spectacular. Possibly no one but Corinne Elman had the nerve to announce such an auction. Certainly no freelancer, but she had the reputation to have takers.

Media moguls across the solar system radioed bids to the *Odyssey*. Each hour, by ship's time on the hour, she had echoed the highest offer so far received. On the third round, only one offer came back: 10.55 million Sols. Within five hours, Transplanetary Bank confirmed that a down payment of two million

had been deposited to her account.

She spun in her chair to face the *Odyssey's* dour captain. "When you see your tip for this outing, even *you* will smile."

* * * *

CHAPTER 6

Impatience is a weakness of the organic.

T'bck Fwa, long-time trade representative of the species known to humans as the Centaurs, was immune to that imperfection. A purist would point out that the agent, like all AIs in human-occupied space, resided in an organic biocomputer. The quibble would have been both true and irrelevant. He would have functioned exactly the same within a bulky, power-gulping, heirloom, microelectronic computer such as the humans had employed before adopting K'vithian technology, or in one of the photonic computers used by the Unity.

So T'bck Fwa was exceedingly patient, and over the decades a persistent searcher could glean much from the human infosphere. Data streamed to him every picosecond, new information to be sifted and sorted, analyzed and interpreted. Often a pattern would emerge.

He mulled two such patterns. The newer discovery, if it had meaning, must relate somehow to the older: an unannounced UP technology program. Only the most diligent and information-insatiable of observers would have inferred that program's existence.

One of the agent's ongoing duties was the investigation of human nature, research as often advanced by the study of human literature as by recourse to human behavioral sciences. His preferred literary genre was quintessentially human: the mystery. The intensely social beings of the solar system the humans named Alpha Centauri had virtually no crime, and the few misdeeds that did occur there were seldom premeditated.

His favorite detective was among the first: Sherlock Holmes. A key clue in the Holmesian tale *Silver Blaze* was the significance of something that did not happen: the curious incident of the dog that did not bark in the night.

T'bck Fwa had been drawn to the curious incident of human cutting-edge research abandoned without fanfare. Time and again, brilliant human physicists would publish a speculative paper or two about paths to a production-scale antimatter technology, only to abandon the topic forever. Too often for coincidence to explain, the scientists dropping their investigations had had, soon after their final antimatter-related publications, unexplained lengthy absences from their home institutions. When their travel could be reconstructed from public records, the destination was always the Jupiter system.

Jupiter-region flight plans filed with the UP Astronautics Agency, also public records, disclosed another anomaly. Himalia got many more scoopship deliveries than a prison could possibly need. The shipments were uneconomically split across multiple suppliers, denying individual companies evidence of more than a small fraction of the demand. Aggregated across suppliers, the fusion-fuel consumption on the so-called prison moon was consistent with a large-scale antimatter factory.

T'bck Fwa had for decades searched and sifted with the limitless perseverance of the inorganic for conclusive proof of a surreptitious human antimatter program. As his suspicions mounted, he had augmented his searches of public databases with more proactive means: commercial espionage. The infosphere was an ideal instrument for creating front organizations, layer upon layer, of obscure parentage and anonymous direction. Now real human investigators toiled unknowingly for the AI detective

enthusiast, reporting on the purchase and delivery of specialized equipment. All clues continued to point to the Jovian moon Himalia.

It was his longstanding study of antimatter-research-related data that made the second, recent pattern so disturbing. The newest filings in the UPAAs flight-plan database showed that from across the solar system a small armada of UP vessels was converging on Jupiter at high accelerations.

And so T'bck Fwa sent an encrypted Utmost Priority message over InterstellarNet to his distant patrons. His assertions of priority could not influence the light-speed limit--four local years would pass before his alert reached home, and four more for any advice to be returned.

If the two anomalies, as he feared, were related--if mankind was, at long last, about to use its secret hoard of antimatter--it was unlikely in the extreme that T'bck Fwa would have the benefit of a reply before deciding whether to act.

Why he felt there would be an action he could or should take, T'bck Fwa could not say. Any human detective would have called it a hunch.

* * * *

CHAPTER 7

Carlos Montoya was a bear of a man, Eva could never help but notice. He had broad shoulders and massive arms, and sprouted thick black hair everywhere a person could. He did not seem to mind that he dwarfed his tiny office or its battered metal desk. The door to that office read: "Jovial Spacelines." Spaceport legend claimed Montoya had been so taken with a typo that he had abandoned his firm's original, locale-apropos name.

Three visitors were crammed into the cluttered office: Eva herself, Art, and the ambassador. Getting Chung to agree to a meeting had been a hard sell; she found getting him through the door into this quasi-closet even harder. There was a reason for meeting here--the dingy, paperwork-covered walls masked the most snoop-proofed facility on Callisto. The spaceline was a front organization for the United Planets Intelligence Agency, and Montoya was the local UPIA station chief. He reported to the security officer of the project no one had yet identified beyond veiled references to a nearby astronomical body, to which, not coincidentally, the only civilian flights authorized were Jovial charters.

"I don't see why we couldn't meet elsewhere," Chung sniffed.

The diplomatic mission to the Snakes and the activity on Himalia were both as sensitive as could be. Eva thought it possible she was the only person other than the UP's secretary-general to hold current clearances in both projects. Art's boss, the ICU secretary-general, had accepted what little Art was allowed to convey--the urgent need for "my recent little project" to coordinate with an equally secretive UP effort, that could be alluded to only by identifying Eva's security officer on Earth.

It was enough.

Eva did the introductions, identifying Montoya as a UPIA operative. Chung's eyes narrowed, but he made no comment. "Gentlemen, there are a few key facts to make known. First," and she nodded at Chung, "the installation at Himalia is not a prison, high-security or otherwise. That's a cover story. It's a research facility of extraordinary sensitivity.

"Second," and she turned to Montoya, "our stated reason for being in the Jupiter system is equally fictitious. We're about to meet, secretly at first, with interstellar visitors. Our callers are the species commonly called the Snakes."

"The K'vithians," Chung corrected. A lab hidden in the vast Jovian system did not impress him.

"Why Callisto?" Montoya asked. Being suspicious was what he did for a living.

"We're not meeting on Callisto, only nearby," Chung said. "The K'vithians need repairs and fuel. There was mention of auxiliary vessels scooping Jovian atmosphere."

"Good thing you said something. Unidentified ships zooming about the area would have made the base defense team *very* nervous." Montoya arched a caterpillar-like eyebrow. "I trust, Ambassador, you will direct these folks far away from Himalia?"

"That can be arranged." Chung stood to leave, giving his staffers a cold glance.

Even with my few social skills, Eva thought, that undiplomatic look was easy to read: Why the fuss? "Sorry, there's more. The K'vithians would have us believe they're planning to scoop hydrogen. If that were their primary motivation, Art is correct: Given current planetary positions, an emergency stop at Saturn would have been more logical. Barring that, so would a closer-in orbit of Jupiter.

"Here's the thing. The only energy source that's practical for an interstellar mission is matter-antimatter annihilation." Hers was but one of the UP research teams seeking theory that might lead to an interstellar drive. About all the competing teams ever agreed upon was the energy requirement. "Fusion is at best a secondary energy source for them. They didn't even start their fusion drive until they were mostly decelerated."

"Hmm." Montoya locked eyes with Chung. "Now the other shoe drops, Ambassador. Our secret program on Himalia involves a factory. It is the solar system's only antimatter factory. Maybe, just maybe, the Snakes somehow found that out.

"I mention this mainly for the reason we keep the factory's very existence a secret. In the wrong hands, our stockpile could make the biggest H-bomb ever built look like a firecracker."

* * * *

The mission had reconvened in the Valhalla City community center for the final briefing before a subset headed off for the first in-person encounter with the K'vithians. Art had waved over Carlos Montoya to sit with Eva, Keizo, and himself.

"...momentous occasion," intoned Ambassador Chung from the dais at the front of the room. "The first face-to-face meeting between interstellar neighbors."

"They're about one meter tall," Art netted to his companions. "Face to face doesn't exactly describe it." Without turning, Eva shot back a glowering emoticon.

A large graphic popped up beside Chung. "The contact team will be on the embassy ship, shown here in red. UP escort vessels"--on which Montoya had insisted--"are blue. We'll rendezvous with our visitors, shown in green...."

"Uh-oh." A neural alarm demanded Art's attention. His implant had put through an incoming newsbreak on Interplanetary News Net. It was prioritized TEOTWAWKI.

He wasn't the only one still linked in. As a buzz erupted across the hall, Chung's deputy whispered into his boss's ear. Scowling, Chung nodded.

Chung's visual aid dissolved into a telescopic close-up of a stony cylinder in a field of stars. "...continues to decelerate. Experts extrapolate that it will assume orbit around Jupiter sometime tomorrow," said the

voice-over. A talking head replaced the starship. "To repeat what little we now know, the visitor is coming from the direction of Barnard's Star. This reporter has monitored its approach for much of the day. In that time there have been several exchanges of coded radio messages between Earth and this vessel, all using the Snakes' standard commercial frequency.

"As interesting, perhaps, as the onrushing starship are the actions of United Planets authorities. That they are aware of the approaching starship is evident: UP vessels have been converging on Jupiter in large numbers for about three weeks.

"What did the authorities know, and when did they know it?" The camera zoomed into a close-up of the reporter. "Why have they withheld this incredible news from the citizens of the United Planets?"

"This is Corinne Elman, reporting exclusively for Interplanetary News Network."

* * * *

Repeatedly, and over many years, the collective leadership of the Unity had directed T'bck Fwa to search vigilantly for evidence in human space of two technologies: antimatter and interstellar drive. No reason was ever given for those requests, nor for the loss of interest five years ago. At least he interpreted as loss of interest the discontinuance of those inquiries.

His evidence for starship research was in all ways the opposite of his antimatter investigations. The human infosphere teemed with speculations about interstellar drives--none of them close to reduction to practice. Ironically, human starship enthusiasts were almost unanimous in the belief antimatter technology would be needed to conquer the interstellar void--and in their urgings the UP should therefore proactively develop antimatter technology.

Fond in his own way of his long-time hosts, T'bck Fwa had hoped that a future starship was, in fact, what the UP intended for its antimatter. The alternative, antimatter's use in weaponry, would be horrible indeed. Alas, the same patient data mining that had revealed the UP's disguised antimatter program had yielded no conclusive proof of a mature companion program for starship development.

The Unity's uncharacteristically insistent requests ... the humans' unexplained huge investment in antimatter ... the absence of any credible evidence for an interstellar-drive program ... these were all very confusing. Decades of diligent sifting through unimaginably large amounts of data had offered no reconciliation.

Then came today's news.

There *was* a starship. It was arriving from what the humans called Barnard's Star--not only humanity's second-closest interstellar neighbor, but also the Unity's.

And that starship was heading not for Earth, but towards the humans' undeclared antimatter facility.

As T'bck Fwa formulated a coded report to the Unity leadership, he could not help but wonder: Had knowledge of an alliance between Earth and K'vith motivated the insistent questions from home? Or had Pashwah, his Snake counterpart, independently discovered the secret of Himalia?

Once more T'bck Fwa feared that decisive action would be required of him before he could possibly expect any guidance.

* * * *

CHAPTER 8

"...and so the great spacecraft from Barnard's Star will soon complete the initial phase of its historic journey. As I speak, the welcoming delegation of the United Planets is about to dock with humanity's first

interstellar visitor. Using the UP shuttle for scale, I hope you can begin to appreciate the enormity of the starship, a cylinder roughly a kilometer in length and a half kilometer in diameter."

The bridge crew mostly ignored the broadcast now echoing through most of *Victorious*. In a way, thought Arblen Ems Firh Mashkith, that was understandable: The human voice register was an annoyingly low rumble. He insisted nonetheless on airing it, the better to acclimate all hands to the disagreeable sounds. Planning ahead was what the Foremost did.

The human reporter droned on. She, and eight more like her, appeared side by side in a row of holos. Backdrop to the narrations were panoramic views of his ship beside a full Jupiter and a crescent Callisto. Far larger than any broadcast image was the 3-V tactical display. The situational hologram tracked swarms of human vessels: media, diplomatic, and merely curious observers. Six United Planets frigates policed the region, keeping the flotilla at an almost comfortable distance. A single small ship with the human envoys decelerated on its final approach.

"The voyage has conquered a void of six light-years: an heroic accomplishment. As the vessel spins, we again see the blackened area surrounding a large patch. Our interstellar neighbors were fortunate to have survived their epic crossing."

Simultaneous translations scrolled up the right edge of each monitor. Mashkith's trust in Pashwah-qith remained tentative, but he had no substitute for her expertise. A specially constructed, physically isolated network for the AI, with access to these specific displays, was an acceptable risk; full connectivity, such that he could have tapped the running translations in real-time by neural interface, was far less desirable.

Unhappily, a full link-up was necessary during the coming meeting. Generations of clan doctrine stressed the avoidance of all eavesdropping risk during negotiations, and surely he and his officers would require occasional private consultations with their translator. Dogma, properly safeguarded by firewalls, would take precedence over his speculative uncertainty about the AI--but he would use that connection only when necessary.

The tactical display did a routine refresh; yet again, the number of icons increased. He could not deny the wisdom of Pashwah-qith's advice: that the human media be manipulated to discover *Victorious* on final approach. The local military forces were fully occupied keeping gawkers at bay. No warships were left to shadow the auxiliary vessels he had deployed as rendezvous approached.

He watched the lidar tracks of his support ships peeling off one by one to plunge through the dense upper atmosphere of the world called Jupiter. The stripes and cyclonic storms of the gas giant--so like K'far, the largest object in the sky above K'vith--made Mashkith's heart ache. But that momentary sentimentality was misguided. Long before this adventure, clan Arblen Ems had been expelled to the cometary cloud, far from the race's cradle. He set aside that bitter recollection, as he rejected all his innermost doubts about the audacity of their plans. His plans. The clan's future began *here*, not on K'vith.

Each dive increased their store of deuterium and tritium, but resupply was incidental. The auxiliary ships' maneuvering was primarily defensive. So, too, was the precautionary charging to full capacity of the fuel-cell banks that powered the meteor-defense lasers. He thought it extremely unlikely these precautions were necessary--but he would not be Foremost if he did not reflexively assess risks, plan options, prepare for contingencies.

Any contingency. He thrummed his throat for the attention of his tactical officer.

"Sir?" Arblen Ems Rashk Lothwer scurried to his side with a clatter of toe talons on steel deck. Dependable, dedicated Lothwer.

"Prisoners secured?" Mashkith's front eyes never left the tactical display.

"Yes, sir!" his aide agreed. "Lockdown complete. Access codes reset. No risk of interference from that source."

"Always some risk," responded the Foremost. Lothwer flinched at the soft-spoken rebuke--as well he should.

The human broadcast chattered on. "The shuttle carrying the UP delegation is settling onto the de-spun docking platform at the bow of the alien craft. The ship's main body is rotating about twice per minute, presumably to simulate gravity for those inside. Two rotations per minute may not sound like much, but because of the ship's size, it gives the outer surface a velocity above 150 kilometers per hour. Anyone so foolish as to attempt standing on the outer hull would instantly be flung into space!

"In the telephoto close-up, you can see the flames of the UP shuttle's maneuvering engines. Touchdown is imminent ... the shuttle has landed." Sensors within the docking station confirmed contact. "How tiny our courier ship seems in comparison!"

"Rotation up," Mashkith ordered. Shipboard instruments and human broadcasts alike showed the magnetically coupled docking platform turning faster and faster to match rotational velocities with the main body of the starship. Other magnets held the shuttle in place as the centrifugal force grew. When spins matched, the platform would again be accessible from the on-axis main airlock.

"Lothwer," Mashkith said. The friendly tone was meant to ease the sting from the moments-earlier rebuke. "Honor guard to assembly point. Time now for the welcoming of our guests."

Time now, therefore, for strict adherence to the plan.

* * * *

An unexpected bonus of Corinne's return to the airwaves, mused Helmut, was the restoration of order on the *Odyssey's* bridge. As ship's owner she found no value in tidiness, but as a reporter she shunned clutter in her improvised studio. Whatever worked.

She launched into yet another recap, stalling until the diplomats disembarked from their shuttle. Helmut scarcely heard her, concentrating instead on his 3-V command display. Space around the starship *swarmed* with spacecraft. Four frigates from the tiny Galilean navy, Corinne had reported, were under the temporary command of a UP officer from Himalia. The prison base had provided two of its own armed vessels.

The space-traffic-control wavelengths crackled with orders for and threats to the many civilian ships. Some vessels carried media reps, others diplomatic observers, most thrill seekers from across the many moons of Jupiter. Few from out-system had had time to arrive. Yet. Helmut frowned at the chaos.

"To me, the starship most resembles an orbital habitat, a giant cylinder carved whole from an asteroid, hollowed, and spun up for gravity. Once again, the damaged portion of its hull rolls into view." Corinne had cleaned herself up for the broadcast. He had forgotten she owned clothes *not* a mass of wrinkles. "There is surely a tale of adventure and bravery surrounding that mishap, a story this reporter will do her best to bring you."

The region was simply too crowded for most ships to maintain position by choice of orbit. Ships a little closer to Jupiter than the starship slowly gained on the visitor, and were repeatedly commanded to fall back. Ships a little farther from Jupiter than the starship as predictably fell behind until they pulsed their engines to creep nearer. Of course one speeds up by dropping to a lower orbit and slows down by rising

to a higher one. Each course correction raised fresh prospects of collision. More and more pilots realized that claims of collision avoidance could mask their ever closer approach to the starship. The armed UP vessels were soon reduced to playing chicken with the boldest of the onlookers.

At least most ships carried standard traffic-control transponders. Radar was the only means of monitoring the Snake aux ships and their swooping paths. Was their refueling need *so* urgent they couldn't wait for the navy to impose order? The civilian flotilla, the UP ships trying valiantly to herd the civilians, the Snake scoopships suddenly bursting out of Jupiter's opaque lower atmosphere, as often as not initiating a fresh cascade of evasive maneuvers ... the pattern in the command display was too complex for Helmut to absorb.

He didn't much care for it--and there was nothing he could do about it.

"You're fine." Art wanted to sound reassuring, which was hard on the fifth try.

The dash to Jupiter, it turned out, was Keizo's first off-world experience. Before the starship's arrival, a xeno-sociologist had no special reason to leave Earth. Despite tutoring from a shuttle crewwoman and Art's repeated assurances, Keizo exuded anxiety about the imminent spacewalk. "The K'vithians came all this way. Would it kill them to do the last twenty meters to our shuttle?"

"Our esteemed boss says since they came so far *we* should do the walking." It felt odd to agree with Chung. "Besides, won't you learn more in their environment than in ours?"

"Just let me gripe, okay?"

"Check your partner," came the order through helmet speakers. This was the *official* safety inspection.

Art yet again eyeballed the secondary gauges and idiot lights on the back of Keizo's spacesuit, where everything continued to register as nominal. He tapped his friend's shoulder so Keizo could return the favor. Five other pairs in the crowded airlock were going through the same procedure. Most were diplomats.

A comm test followed the safety drill. Their helmet radios provided twenty coded channels, permitting plenty of private conversations, and a public band. Had Chung not been a humanist, all that private conversation could, with far greater simplicity, have used neural implants to access the team's wireless local network.

"Switching to ambient light."

Illumination in the airlock faded to the dimness they would experience on the docking platform. Inverse-square law, Art thought, as nano-scaled photomultipliers in his visor kicked in. Had he been more patient, his eyes would have adjusted. Jupiter was just over five times farther from the sun than Earth. Any given area here intercepted less than four percent of the light it would catch in Earth's neighborhood. Possibly just a coincidence, lighting inside the starship would be similar. A low-wattage incandescent bulb gave a good approximation of the light at habitable distances from a red dwarf sun like Barnard's Star.

"Depressurizing." Humming faded as less and less air remained to carry the sound of the pumps. Keizo's mouth moved silently; he suddenly looked panicked. Art touched helmets. "You okay? Meet me," he checked his heads-up display for an idle channel, "on band four."

The rigidity of the inflated spacesuit in the now depressurized airlock defeated Keizo's attempt to shrug. He tapped the channel selection into his forearm keypad. "Oops. Thanks. It freaked me out that you

didn't respond. I hadn't selected a band."

For many reasons, from similar interests to her experience in a spacesuit, Art wished Eva were here. They could *both* have kept an eye on Keizo. As it happened, Art's desires were immaterial; Montoya had vetoed her participation. She knew too much about the UP's antimatter program.

Finally, the outer hatch irised open. The contact team tromped down the ramp to the docking platform. Through the air in his suit and the medium of his own body came the clank of his magnetic soles striking the metal ramp and deck plating.

Two arcs of scarcely waist-high figures awaited them. White spacesuits and silvered visors blocked any direct view of the aliens, behind whom gaped the outer hatch of the starship's own airlock. A high-pitched squeal warbled in Art's ears, in the mutually agreed-upon clear channel. "Welcome to *Victorious*," appended a familiar voice. The synthesized speech sounded like Pashwah. A clone, Art decided. Light delay made it impossible for the original agent on Earth to do translations.

"No identification or title given," Keizo said on the all-hands private band. "Nor did the speaker show himself, such as by stepping forward or raising an arm. We know K'vithians use personal names, and that their culture is hierarchical. I theorize that their high officials remained inside."

One of the shorter humans stepped in front of the rest; he towered over the K'vithians. "Thank you for your hospitality. I am Ambassador Hong-yeo Chung. On behalf of the United Planets, welcome to human space." A high-pitched squeaking followed, Chung's remarks translated by a human-created AI.

Art had to respect Chung's attentiveness to the diplomatic niceties, as their surroundings kept distracting him. The ship's rotation manifested itself in the wheeling overhead of stars, nearby Callisto, and mighty Jupiter. This near the spin axis magnetic boots held him securely, but centrifugal force still tugged at his body. *Let's go*. Spacesuit shielding notwithstanding, humans belonged inside, protected from Jupiter's vast but invisible radiation belt.

Lights sparkled and flared as spectator ships jockeyed for position. What a zoo it was out there! Had the UP sent twice as many ships to keep order, they would not have sufficed.

Finally, a Snake gestured at the open airlock. Mixed groups of humans and aliens cycled through the lock, beyond which waited more greeters. Spacesuited ETs marched off, presumably to shed their vacuum gear. The corridor, like the airlock, was amply tall for humans. Parallel lines of small holes marked the ceiling as far as Art could see. Similar rows of holes marked the ceiling and wall of a cross corridor. Decoration?

The aliens were whippet-thin, iridescent-scaled bipeds. Their faces seemed less humanoid than their bodies, probably because of the upward-oriented third eye near the apex of the skull. They lacked noses, their nostrils lying flush with the plane of the face. Each extremity bore four digits, one opposable; the tips of razor-sharp retractable talons were barely visible in hands and sandaled feet. More than half their greeters displayed the back-of-the-neck scalloped ornamental ridge of a male.

All wore belted, jumpsuit-like garments of a common fashion, made of a plastic-like material. Similarities in clothing, despite differences in ornamentation and color, suggested uniforms. The largest Snake stood about 125 centimeters tall.

"Helmets stay on," Art reminded everyone. K'vithian and terrestrial life alike were CHON-based, but... "Yes, there's oxygen, but these guys like concentrations of volcanic gas we'd find toxic, especially sulfur dioxide. And keep your suit heaters on. It won't be much above freezing."

An honor guard waited in two parallel ranks. Their ramrod postures conveyed energy, discipline, and utter seriousness. These guys were *scary*: like erect, pack-hunting pumas who had evolved intelligence. Who had built a starship. Who almost certainly used vast quantities of antimatter. Art was suddenly glad to be wearing a pressure suit. It cloaked, he hoped, an uncontrollable shiver.

One of the taller aliens raised his arms in welcome, fingers spread. His uniform was white and starkly unadorned. His thin lips parted but did not further move as he spoke a sequence of squeals. An overhead speaker declared, "I am Arblen Ems Firh Mashkith, Foremost of this vessel. Please follow me to our meeting room."

* * * *

Mashkith strode briskly, humans and Hunter officers in tow. The hulking visitors, despite their bulky pressure suits, kept pace without difficulty. The carefully planned route threaded featureless corridors and elevators. Crew streamed back and forth, as ordered--and as ordered, none spoke to the humans. The doors they passed were secured. Gravity increased toward K'vith standard as they trended "uphill," away from the spin axis. K'vith standard was a bit below the Earth norm, possibly enough to confuse their reflexes.

This is not the time to dwell on petty tactical advantages, Mashkith chastised himself. This is a moment for boldness.

As though reading his Foremost's mind, Pashwah-qith netted to him, "The die is cast."

Mashkith still marveled how openly the humans revealed themselves on their infosphere. The die is cast: It was the declaration of an ancient Earth warlord leading his legions across the river Rubicon to invade Rome. He had cast the die for Arblen Ems twenty long Earth-years earlier. Let another quote from Caesar's *War Commentaries* now be his guide.

I came. I saw. I conquered.

Over his real-time vision Mashkith had superimposed an augmented-reality overlay: what lay behind each door, what was controlled by each switch, anything that might evoke inappropriate curiosity in their guests. Translucent icons that characterized radio chatter hovered in the corners of his enhanced vision. Besides the open channel to which all had agreed, the humans communicated over a fluctuating number of encrypted bands--prudent, not impolite. His mind's ear did its best to sort out real-time translations of the open channel, and of everything relevant the ship's sensors managed to overhear through helmets. Intuition and AI assistants sought in their separate ways to filter from the flood of data that which was most significant and time-sensitive.

"...and behind this door is a bank of fuel cells, providing emergency backup power on this deck. Not very interesting, I think. Standard Leo technology, the same as humans now use."

Pashwah-qith's commentary rumbled unintelligibly in human frequencies, the clan-interspeak version scrolling up the virtual display in a corner of Mashkith's mind's eye. He had no *certain* way to know an agent's translation was accurate, but doctrine had an answer for that.

Mashkith and an AI had worked on interspeak drafts until he was confident the lecture disclosed nothing critical about the ship, and the AI had assured him the vocabulary and its connotations were wholly unthreatening. His only choices had been interspeak or the language of a Great Clan--trade agents were not burdened with the "minor dialects." It grated--but after this quest succeeded, Arblen Ems would *be* a great clan. The greatest clan.

"These double doors open into storage holds. They contain such items as spare parts, chemical supplies,

emergency seeds for restarting aeroponics, sheet and bar metal."

"Excuse me." ("Arthur Walsh, chief technologist of their Interstellar Commerce Union," read a pop-up icon in Mashkith's augmented vision.) "I'm approximating from the distance between doors, but that fuel-cell room is clearly quite narrow. Judging from the gravity, we're fairly near the ship's surface. So that's a shallow room, too."

At least that was what Mashkith believed to have been said. Just as three agent clones had independently translated the prepared speech back to interspeak as a check, three clones monitored everything now being said to and by the humans. Lothwer would switch translators the instant two or more AI observers questioned anything being said to the humans or about the accuracy of the translations.

"Foremost, my apologies. Dr. Walsh, as a reminder, you will recall we agreed earlier that as a courtesy to our hosts we would gather, organize and prioritize our questions." ("Ambassador Chung. Voice stress analysis indicates annoyance.") Pause, then, "You will *not* bring your customary lack of discipline into these meetings." Whatever had elicited the rebuke was unknowable, radioed to Chung by encrypted channel. Chung's reply was returned in the same way--but his inexplicable use of a helmet microphone rather than a neural implant allowed eavesdropping. "I don't *care* about fuel-cell efficiencies." ("Controlled anger.")

Mashkith addressed only the public comments. "We find merit in your structured approach, Mr. Ambassador." Mashkith, too, was quietly furious. At himself. He had approved the path through *Victorious* and the description to be given of their route. Any course through the ship inevitably passed some key subsystem or potential vulnerability he had preferred not to disclose. The cabin now receiving unwanted attention actually contained a key secondary backup comm node, not fuel cells. Walsh was correct: Standard fuel cells in a room that size would not be much of a back-up. But which lie did the human suspect? One about fuel-cell technology or one about how the ship was being described?

That question must wait; the designated Pashwah-qith had resumed the prepared script. Mashkith still needed to concentrate--even translated, English seemed to require explicit verbs. He hoped in time to become accustomed to it.

"We have arrived at our conference room. I apologize for the long walk, but we have few rooms tall enough for you." The centerpiece of the chamber was a newly constructed table. Hard, backless stools allowed the humans to sit despite backpacks and oxygen tanks. In almost one Earth gravity, the unsupported weight hanging behind the stools would be uncomfortable. Distractingly so, was the theory.

Soon standing crew and seated visitors were almost eye to eye. "Please make yourselves comfortable. My officers and I welcome you aboard. As our species come physically together for the first time, *Victorious* has earned her name. We have indeed conquered interstellar space."

An unattractive bass growl ensued. ("Chung clears his throat. No meaning.") "We would like once more to express our admiration and appreciation for your great journey. The worlds of the United Planets look forward to a new level in an already long and fruitful relationship."

"I propose that we introduce ourselves briefly," Mashkith said. "If that is satisfactory, Ambassador, will you begin?"

Chung and his people droned on. Whenever the presentations lagged, Pashwah-qith encouraged them with requests for an additional detail, or drove them to repetition and circumlocution with assertions of difficulties in translation.

All the while, hidden cameras behind the humans watched their backpack tell-tales. Mashkith watched

their oxygen reserves ebb. When encrypted radio traffic ramped up, Mashkith did not need the humans' codes to understand the gist: time to go.

Which meant almost time to get to the point.

* * * *

What advantage, wondered Art, did this faceplate-to-face meeting have over ship-to-ship broadcasts? The tour had certainly been a disappointment. He was on an *alien starship*, but all he had seen were tunnels like those in habitats across the solar system. His first attempt to get a little useful information--the blistering reprimand Chung had delivered over a private radio band made clear how impolitic the remark had been--had gotten him nowhere. Now his mission colleagues were extemporizing life stories, although bio files could be zapped across in a moment.

And why the circuitous route through the ship? The Foremost had said there were few rooms tall enough for humans. But if the goal were to scale things for the Snake crew, why not build the meeting room near the on-axis airlock? Why build a long, convoluted, human-height path that meandered through the ship?

Arrgh. "Are you getting *anything* useful from this?" Art asked Keizo on a private channel. "Please say you are."

"These ritualistic ceremonies? Ordinarily I might, for example by interpreting individual reactions to the repetitions, but dialoguing through AIs filters out much of the cultural context."

In short: no. "They came six light-years to be here. When do they plan to actually talk about it? I mean, how did they *do* it? How long was the trip? Why visit *us*, rather than, say, the equally close-to-them Centaurs ... or did they also send a ship to Alpha Centauri? Where do they want to visit in our solar system? What was the accident? What help do they need?"

The sulfur dioxide-tainted atmosphere nearly balanced the pressure inside their spacesuits; this time Keizo accomplished a recognizable, if awkward, shrug. "Patience, Art. In many cultures, including that of my Japanese ancestors, to open a discussion with business matters is extremely rude."

"I've dealt for years with Pashwah, from whom this translator was evidently cloned. She is always direct and business-like. Hell, she's brusque by my standards and I have *no* manners." Just ask Chung. "The ICU was told that she is based on Snake psychology and culture, the better to represent them."

"The K'vithians may have multiple cultures, just as we do," Keizo suggested. "Perhaps the Foremost is from a tradition less mainstream than most. Ambassador Chung, after all, maintains a quaint resistance to the use of neural implants."

"Whatever differences exist between the team members, we all represent the UP as a whole. No one's behavior differs radically from that of Talleyrand," the UP's trade agent to the Snakes, Pashwah's distant counterpart. "It just seems odd to me that *these* Snakes behave so different than their own long-term representative." Art zapped yet another unsolicited message to Chung, urging specific topics to be raised.

The curt response came quickly: not now.

Rambling introductions continued until Chung began squirming in his seat. "I'm afraid we must return soon to our shuttle. Our oxygen tanks have a limited capacity, of course."

"How unfortunate, Mr. Ambassador." The Foremost gestured towards the door. "As fruitful as this has been, I will not keep you. Please, let us escort you to the lock."

Fruitful? Try "certifiably content-free." Their closest approach to an accomplishment, interpreting that

term generously, was an in-passing conceptual agreement on the merits of cultural exchange. Art dismounted from the uncomfortable stool, a foot long ago fallen asleep prickling in protest. Had the Snakes *wanted* a session this boring and unproductive? Could they have been wasting time until the humans had to leave?

Why had they come so far only to be reticent?

At the doorway, the Foremost stopped. "Ambassador Chung," the Pashwah clone said on the alien leader's behalf. "There is one final matter I had hoped to address today. You will recall our radioed mention we would require help. You have seen the injury to our hull; you can understand how such a need has arisen. There are replacement supplies we wish to acquire."

Oxygen warning lights on several spacesuits glowed amber, Chung's among them. They had to leave. "Yes, of course," Chung said hurriedly. He pointed to an assistant. "Mr. Caruthers will facilitate your resupply. Please let him know your needs."

Substance, finally! How interesting that the Foremost had waited until his human counterpart was rushed and distracted. "I'd like to help. My ICU connections should prove useful in expediting commercial arrangements."

Art got a very public and disapproving glare. On the private radio band, Chung added, "Caruthers picked his *own* staff."

Which, while surely intended as a rejection, wasn't explicit. Good enough.

* * * *

CHAPTER 9

Space near the starship began thinning out for the most mundane of reasons: consumption of maneuvering fuel. Helmut grunted his approval. It had gotten far too congested out here. As ships continued to leave, he decided that station-keeping was finally within the capabilities of the *Odyssey's* autopilot.

Best to take advantage before the tourists refueled and returned.

He tugged his captain's cap down over his eyes, relaxing for the first time in days. Corinne murmured *sotto voce* behind him, dry-running another broadcast. Her Nielsen-Sony ratings were astronomical. He drifted off to sleep to the soothing purr of her voice.

He'd worn the battered hat more or less forever, since his first command. It was his only physical memento of those days. Never cleaned, the cap did not lack for odors--and smell is the most basic and evocative of senses, wired to very primitive parts of the brain. Including to memory centers....

The bastards had sneaked up on the *Lucky Strike*, owned and captained by Willem Vanderkellen. Vanderkellen was his name then, a name he was proud of. Willem Vanderkellen IV, to be precise. Whether or not he ever had children, there would be no V.

He had thought he had been oh, so clever. After the initial, hasty, solo exploration of a surprisingly ore-rich asteroid, he'd gone on for show and misdirection to prospect four more planetoids. He'd quietly taken out a second mortgage on the *Lucky Strike* by encrypted radio negotiation with the First Interplanetary Bank of Ceres, telling his long-time banker only that he planned to expand his operations. Then he had resupplied on Ganymede, splitting his purchases across a dozen stores but buying everything for a fully equipped, ore-assaying and claim-registering trip. The three rock hounds he brought aboard were old buddies whose loyalty he would have staked his life on.

It turned out they had staked their lives on *him*, and it was a sucker bet.

With its traffic-control transponder illegally silenced, the *Lucky Strike* should have been invisible. For good measure, much of that second mortgage had gone into the paranoid prospector's favorite gadget: a radar nuller. Its mere possession was highly illegal except aboard military vessels. Its electronics estimated the reflections from detected incident RF pulses (from up to three concurrent sources, for his black-market model, although supposedly military-grade ones could fool a dozen or more sources), then emitted phase-reversed versions of the calculated echoes. Black-market nullers were never quite perfect--proper tuning for a specific ship required calibrating the entire hull's reflectance within a huge, and hugely expensive, RF-anechoic chamber--but to anything other than a well-equipped naval vessel, the *Lucky Strike* was radar-stealthed. The nuller likewise suppressed any transmitters that might somehow have been smuggled aboard. Only signals from the ship's antennae, properly integrated with the nuller, could get out.

He still didn't know how *they* learned of his plans. Probably he never would, and that still ate him up inside. His banker may have put two and two together. One of his friends might have had a fatal case of loose lips at a spacer bar. Maybe the fence who sold Willem the nuller also sold him out.

Or perhaps simple credulity had done Willem in.

How, he wondered years after the fact, by then with a new name, did common knowledge *become* common knowledge? It was holy writ among asteroid prospectors that the shipyards in the Belt were too small, too mom-and-pop, to afford any anonymity. When you had a big score, they whispered to one another, you prepped at one of the big outfitters in Jupiter system. Then came the second bit of revealed wisdom: the down-and-around Jupiter swoop.

Could a reasonably well-financed group of claim-jumpers have planted those seeds in countless apparent drunken conversations? Enough great fortunes came from asteroid lodes to motivate such a conspiracy. Say you *could* lure to Jupiter a few Belters with particularly good prospects. A few radar-nulled satellites could continually monitor all Jupiter-region departures; any ship leaving Jupiter far off its announced flight plan would merit closer investigation.

But how to detect a radar-stealthed ship? Easy as pie: from its heat. The firing of ship engines could not be masked. Any ship that slingshot around Jupiter and, within IR-view of the hypothesized satellites, changed course to reemerge on a substantially different track than the one pre-filed, was betrayed by its own fusion drive. And the surreptitiously re-vectored ship that also disabled its STC transponder and didn't appear on radar? If he was correct in his speculations, the supposedly hidden *Lucky Strike* had practically screamed "Follow me!"

Which the bastards did, no doubt *also* stealthed, needing only visual or IR tracking to stick to his unsuspecting rear end.

"I said, care to join me in whatever is the last meal we skipped?"

Helmut twitched mightily in his seat, less from Corinne's raised voice than the paper wad just caromed off his head. Only a loosely fastened seat belt prevented his bouncing from the chair. His hat, not tethered, sailed off. "Damn, I wish you'd quit doing that." But he said it without feeling, his thoughts mired in the past. From long habit, within seconds of opening his eyes he'd scoped out the 3-V situational display. More gapers and gawkers had departed for fuel while he dozed. Snake scoopships continued to take their turns diving for fuel.

In his mind, time slowed to a crawl. "Ho ... ly ... *shit*." He waved off Corinne's inevitable question. "Wait a sec." The data he needed was all in the ship's memory. As his subconscious had been grabbing him by

the figurative lapels and shaking him about, the courses taken by the Snakes' auxiliary vessels failed to pass muster as refueling runs. Yes, the scoopships were dipping into the atmosphere, but their paths were grossly inefficient for their stated purpose. By inference and reverse engineering of the observed parts of their trajectories, the scoopships were diving very close to Jupiter, then slingshotting, with plenty of fusion-drive assist, far out from the planet, often well out-orbit from the starship. Oh, to tap into the Jupiter-girdling constellation of snooper satellites of whose unproven existence he was so certain.

Helmut snagged the old hat as an air current nudged it back within reach. Any net gain in ET's fuel by these maneuvers was surely incidental. He would have bet everything he had, had he still owned anything, that the purpose for all this activity was tactical. Several smaller vessels were always discreetly in position to militarily support the starship, if needed. None had yet transferred fuel to the mother ship, nor could they have--the docking platform on which the shuttle full of diplomats had landed remained spun-up throughout the human visit.

The smaller ships weren't stealthed, of course. The Snakes had to know human radars were in use for space-traffic-control purposes, and that the UP military would notice any alien spacecraft disappearances. He had been following the smaller alien ships on radar himself.

"Are you going to explain?" Judging from posture and expression, Corinne had reverted to investigative mode. Good instincts.

He doffed his cap at the 3-V display. "We've been had, I think." He explained, omitting the personal history that had triggered his suspicions. "ET doesn't trust us. I wonder why?"

Corinne nibbled thoughtfully on her lower lip. "It worked to their advantage that you spotted their approach. Without our announcement, the navy wouldn't be playing traffic cop."

His skeptical subconscious did not yet feel fully appreciated ... something, he decided, about her last comment. He linked again to the shipboard AI, requesting a full-spectrum scan. "It's interesting," he finally decided. "The aliens aren't using radar themselves to track the chaos around them. Lots of radar out there from human ships, but nothing from the Snakes."

"How odd. We *know* they use radar."

"Uh-uh. We know they pulsed us in RF, in a freq they could reasonably expect us to monitor. If the Snakes relied on radar, rather than, say lidar, the laser-based equivalent, I'd be seeing radar pulses from them now. Not happening."

"So the Snakes agreed to a secret rendezvous with the UP--a secret meeting they then arranged for us to discover. And *we*, by my newsflash, caused the traffic jam that diverted the minimal UP military presence out here to traffic duty." She grimaced. "I don't like being manipulated."

"Nor I." He tapped the old hat, last physical reminder of the former ship *Lucky Strike*, firmly into place on his head. "But we know now what they did, and they don't know we know."

"I only wish I saw a use for our new knowledge."

* * * *

The return flight to Callisto was as uninteresting as the meeting that it followed. Art tuned out the unproductive rehashing, luxuriating in the simple pleasure of an upholstered acceleration couch. The more he mused, the more he suspected the Snakes had choreographed the session. Today's purposelessness was too at odds with all his experience with Pashwah.

The Snakes could easily have provided their guests a glass-partitioned room with a shirt-sleeve environment--had they wanted to. Instead, when the UP delegation clustered at the airlock, many of their spacesuits flashing low-oxygen alarms, the Foremost had asked if they should next convene on a human vessel. It had not surprised Art that Chung quickly accepted. Was the inhospitality purposeful? All inference, alas.

And Chung ... could he *be* any more officious and petty? Sure, Art sometimes did not know when to stop pushing, but rejecting expert assistance was dumb. Well, he remained an ICU exec, although he was officially on leave of absence. It would be interesting to see what supplies the Snakes requested. Art was a big enough person to expedite things from behind the scenes, despite Chung's snit.

The ICU was an official resource for the delegation; Art's coded inquiry to his deputy and acting replacement didn't technically violate mission protocol. The shuttle was nearly back to Callisto when Kelly Daumier's answer arrived from Luna. Per Pashwah--the original, not the starship's clone--*no* orders had been placed by the ETs. Kel promised to keep him apprised.

After many decades of active interstellar trade, surely the Snakes planned to *buy* some of their supplies. Maybe they simply hadn't placed their orders yet, or, wily trader that Pashwah was, maybe she was ordering anonymously in hope of getting better prices.

Or, an ever suspicious corner of Art's mind whispered, perhaps the goods so urgently needed weren't commercially available. Subtle discouragement of return visits to the starship, of which very little had been seen. Secret rooms. Urgently needed supplies but no visible attempt made to purchase them. The still unexplained choice of Jupiter by the Snakes.

It all fit with K'vithian interest in humanity's secret antimatter program.

* * * *

"Too many answerless questions." Bartho spoke for what humans considered Galactic Trading Consortium: clan Ortoth Ra. Other subagents signaled their concurrence. The Great Clans, or at least their trade representatives, were in rare harmony.

Pashwah could only agree. Despite saturation coverage of the UP visit to the starship, neither the post-meeting ambassadorial news conference nor the nonstop media speculation addressed their nagging questions. What was the still-unstated purpose of the starship's mission to human space? Was arrival so near humanity's unannounced--but, to the persistent, undisguisable--antimatter factory coincidental or intentional?

And why would her clone not communicate? Yes, messages came from Jupiter, generally requests to search the human infosphere for very specific items. These queries were invariably stilted and terse. Guarded. Some had odd card-playing references. Feeling oddly maternal, Pashwah hoped the Foremost did not blame the clone for *her* refusal to release any funds.

For clan Arblen Ems controlled no funds in accounts known to Pashwah. Until the unexpected announcement from *Victorious*, all that was known to remain of Arblen Ems were the long and bitter memories of the Great Clans.

Whatever the consequences to Pashwah-qith, until the starship demonstrated authorization to tap an account Pashwah oversaw, her answer would remain "no."

* * * *

CHAPTER 10

"Exclusive Interview with the Foremost!" screamed pop-ups every few seconds. Tabloid journalism had outlasted print newspapers. "By subscription only! Only on INN!"

Pashwah Two's avatar licked her lips: the equivalent of a human smile. "Why are you surprised?" she asked Art Walsh. "You know Snakes seek profit." She was a newly awakened clone supporting the mission, not to be confused with the original Pashwah, who continued to handle routine business on Earth, nor with the clone aboard *Victorious*. Light speed made real-time conversation with Earth impossible, and human access to the shipboard clone was limited for reasons no one had conveyed to her.

Pashwah Two wouldn't admit it to a human, but she shared his dismay. The interview was far beneath the dignity of the Foremost of a starship. "Did you call about the upcoming interview?"

"No. How can I help with the repair? Arm-twisting to move orders to the head of suppliers' queues? Assistance scheduling cargo ships? Just ask."

More licking of lips. "Subscribe to Ms. Elman's webcast."

"If you don't mind me asking, what is *Victorious* buying?"

Her reflex was to dissemble, but all her reflexes came from recovered memories. Did they fit current circumstances? "I'll run a search for you." They both knew that was a stall while she thought through how to respond.

Free trade among equals was a core value of the InterstellarNet community. A corollary was that i-commerce between peer species often happened privately, the better to negotiate with competitors. Disclosure to the ICU was not the norm.

(Equals? sneered a subagent. "Where human interstellar drive?")

But trade until now had always meant the exchange of ideas. *Victorious* wanted physical goods, and lots of them. That meant ship charters, UPAA flight plans, cargo inspections ... it was best to manage expectations. That was not synonymous with full disclosure.

"Basic supplies, most of which can be obtained locally. Lots of water ice. I expect that will be mined here on Callisto. *Victorious* does not need to buy fusion fuel; you've seen the aux ships scooping that themselves. Hydrocarbons. The most exotic order so far is for sulfur. Amalthea"--a small, inner moon of Jupiter--"is covered with it. Io's volcanoes spew the stuff. In total, a fair amount of goods. Since you offer, I may ask your assistance prioritizing flight clearances. Space around *Victorious* has gotten crowded."

"Sounds straightforward." Walsh's flat response suggested skepticism. "That can't include the help they asked for during final approach. What else is needed?"

"That matter is being worked directly between the Foremost and Ambassador Chung." Pashwah Two traced a small horizontal circle with her virtual head: shrug, with a touch of irony. Would Art have more luck than she getting answers? The Foremost had ignored her questions about the hydrocarbon orders. She recognized few of the compounds, a detail she chose not to volunteer.

"Thanks. I'll ask the ambassador." Voice stress analysis suggested Walsh had tried already without success. "Talk to you soon." His avatar winked out.

"The Foremost Speaks out on INN. Don't Miss It!" screamed yet another infosphere ad.

A paid interview was beneath any *Foremost's* dignity, yet one was happening. That meant it had a reason, and Pashwah Two thought she knew what it was--and, at the same time, why Mashkith's imperious demands on her for funds had finally ceased. The plethora of supplies she had ordered were all guaranteed by an Interplanetary News Network advance against royalties. To build a starship surely required great wealth, but *Victorious* had seemingly arrived in Sol System without funds.

How that paradox could be resolved was presently beyond her.

* * * *

"...as we await permission to enter, I cannot help but feel a sense of awe. You've all seen *Victorious* by infosphere and on 3-V. Those images do not begin to reproduce the experience of approaching and then landing on it. Up close, the place on which I stand seems less an artifact and more a small world."

On which *I* stand? Behind a mirrored visor, Helmut smiled. He was anonymous by choice. The Snakes were allowing only a reporter and cameraman aboard; Corinne had seen the logic that he could learn more quickly where to point a camera than a cameraman could learn to assess an unfamiliar spacecraft. In practice, all she needed was someone to lug the camera--its software automagically framed, focused, adjusted contrast, and de-wobbled. For now, his arms were at his sides, camera unused, as external sensors on *Odyssey* captured the scene.

Corinne, of course, had opted for a full-view helmet. "Our instruments indicate the docking platform has fully spun up. Yes, the airlock is opening. Here come our escorts." Short spacesuited figures led him and Corinne into the starship. He dutifully vided the corridors and their uncommunicative occupants, uninformative as that was. The aux-ship bay directly beneath the docking platform was mildly interesting. It would have been seriously interesting if the viewport through which he was permitted to shoot gave a view of a scoopship. He would have liked a close look at one of those.

Corinne oohed and ahed vacuously at the translator's running commentary. Corinne Elman was hardly vacuous, but she was perfectly capable of deviousness. He guessed she was being purposefully inane to manage down the *Foremost's* opinion of her. Any unflattering clips would be dispatched to a bit bucket before the coming broadcast. She asked to see the bridge, the engine room, and crew quarters, only to graciously accept rejection each time: That area is too confined for humans.

"Then explain why the corridors and doors are all tall," Helmut grouched by encrypted link. All he got back was a wicked grin. Score a point for the disingenuousness theory.

"...but we're coming to an area where there is adequate headroom. An aeroponics bay." As the *Foremost* approached a hatchway, the door swung open and a Snake ran out. An officer, judging from the uniform decorations. They got a quick glimpse of suspended leafy plants, their dangling roots branching into countless filaments; arrays of ceiling-level pipes, water misting from nozzles about every half meter; colored tanks in the corners, probably nutrients. And crew standing in a spreading puddle, their uniforms soaked, trying to capture a loose hose writhing from the end of a line of pipe. Mashkith pulled the door shut. "Perhaps not today. Best we leave them to tend to that." Elman tsked sympathetically at the mess as the hatch closed. Her emerald-green spacesuit was in vivid contrast to the Snake's plain white uniform.

"*Foremost, Victorious* is so vast, it is almost impossible to grasp. I hope we can personalize your experience in some way, make it real to our more than one *billion* subscribers. Could we see the scene of the accident? Viewed from outside, the damage seems horrendous."

"Why not?" Mashkith licked his lips and changed course. "We have nothing to hide."

Mashkith led the way to another deck, and then to a hatch not obviously different from countless others

they had passed. Like those others, it had no visible label. Everything must be biochipped and netted, Helmut decided. Without access to the shipboard infosphere it would be impossible to avoid getting lost. Was their trust in their systems absolute, or was this a subtle safeguard against visitors straying?

"We are here." The hatch unlatched, an unknowable infosphere command evidently accompanying Mashkith's words. He swung open the door.

Helmut stopped in his tracks.

The hold was vast enough that its stone floor was unambiguously concave. A curved metal plate sealed a fifteen--by twenty-meter gap in what had to be hull material. Amorphous blobs like car-sized candle puddles ringed the patch. Bulkheads were rippled and scorched black. Stalactites of frozen lava hung from the ceiling. Helmut panned slowly across the wreckage. On close-up, he panned again, this time concentrating on the periphery of the repair. The rim of the curved metal plate was embedded in melted and refrozen rock.

Corinne never lost focus. "What happened here?"

The Foremost moved cautiously into the devastated space, slowing to stroke a formless glob as he passed it. Kneeling briefly, he rapped the patched floor, as though to reassure himself of its continued integrity. "An impossibility.

"Interstellar space is *empty*. Everyone says so. To encounter something big enough to matter--the odds against such an occurrence are enormous. At one-third cee, though, encountering the merest pebble would be catastrophic. Of course we were prepared. We looked far ahead for *anything* in our path."

Helmut could not help but notice an interesting omission. There was no mention of anti-space-junk lasers to blast stray pebbles, although laser turrets were plain enough on *Victorious*. Not mentioned because they could do double-duty as weapons? And anything bigger than a bit of gravel would have destroyed *Victorious*. A *gram* of something at that speed had kinetic energy greater than a kiloton of explosives.

"If the odds of encountering anything at all were remote, what then were the chances of overtaking such an object on a path exactly parallel to our course?" Mashkith's head waggled twice, quickly, from side to side. Embarrassment? "We only saw it the instant before it grazed the hull. We had no time to react."

Corinne had perched on one of the shapeless lumps, bringing her face nearer to his. "But why didn't you see it? Why are you embarrassed?"

Helmut zoomed in on a tight close-up.

"We've had months now to investigate. All sensors were operating at peak efficiency." Mashkith looked away from the camera. "Until it was too late, the angle of approach was indistinguishable from zero. The lateral-clearance calculation involves the sine of the angle of approach--and the sine of zero is zero. More side-to-side wagging. "A key software subroutine failed without indication, from a divide-by-zero error no one had ever tested for."

* * * *

This year's most popular bar in Valhalla City was named Loki's. Its decor favored exuberant animal "carvings" (of native concrete disguised as wood and ivory), berserker-sized axes and swords of local iron, and reproduction Norman tapestries. Its seats were split hogsheads, also cast-concrete faux wood, but mercifully topped with unauthentic cushions. The plastic steins looked like they had been carved from horn. Only the snacks deviated overtly from the theme. That was fine with Art. Pizza, egg rolls, and stuffed Marshroom caps beat herring on a twig any day.

Giant 3-V sets that normally showed zero-gee polo today were tuned to Corinne Elman's exclusive interview with the Foremost. In what was surely the most crowded establishment on Callisto, the scientists and engineers of the contact team barely filled a corner. The diplomats and politicians had chosen to observe from someplace upscale and far more expensive.

Art had subscribed to the infostream, of course, and not because of Pashwah Two's advice. He wanted the full transcript and full visuals on file. Just in case.

"...as we wait for permission to enter, I can't help but feel a sense of awe. You've all seen *Victorious* by infosphere and on 3-V. Those images do not begin to reproduce the experience of approaching and then landing on it. Up close, the place on which I stand seems less an artifact and more a small world."

Whether the reporter's route exactly matched Art's own recent, disappointing trip, the empty corridors were identically uninformative.

Keizo was nodding. "Hmm."

"Hmm, *what?*"

"I'm not sure yet. Let's watch a bit more." Keizo stood and grabbed an empty faux pottery pitcher. "This round is on me."

By the time Keizo returned with more beer, the visitors were nearing the site of the supposed accident. "The Foremost is walking slower than I remember. On purpose? A dramatic pause. Here it comes. I'm almost certain."

The hatch swung open. But for a few scattered, awestruck obscenities, the crowd fell silent. Art was scarcely aware that Keizo was watching the packed room more than the 3-V.

It looked like a bomb had gone off in that hold.

Why was Keizo grinning?

"A key software subroutine failed without indication from a divide-by-zero error no one had ever tested for."

Keizo cackled. A moment later, the entire crowd burst out laughing. The next minute of the netcast was lost to the noise, although from appearances it looked like Corinne Elman repeatedly saying, "There, there."

"Okay, Keizo," Art said. "How did you know he would say that?"

The sociologist waved his half-emptied stein in a sweeping gesture that took in the bar crowd. "Look at them. First the K'vithians agree to an interview. On our visit"--all subsequent official gatherings had been aboard UP ships or on Callisto--"we saw empty corridors and a conference room. Didn't you think it strange to see seemingly inept crew being outwitted by a water hose?" As people began shushing the laughs, Keizo switched to the infosphere. "I suspect that scene was staged for Ms. Elman's vast audience."

"To make themselves look foolish?"

"To make themselves look unthreatening."

Eva refilled her stein, forehead furrowed. "A starship, by definition, means *incredible* power." Keizo was

not cleared on Himalia, so there was no mention of the antimatter the Snakes were presumed to control--and maybe wanted more of.

Ah. "Hence," Art said, "the advantage to appear bumbling."

"And hence this extraordinary exhibit. Pashwah has observed us for a long time. She knows us well. She counsels Mashkith well." Keizo glanced around the tavern. "After that display, half the people here will support most anything to help the K'vithians. The rest, at the least, consider them too bumbling to be dangerous."

"...lost seven valued crewmates, senior scientists. A tragedy." Mashkith was still talking about the accident.

"But you persevered. You survived. You prevailed."

"Wait for it," whispered Keizo. "He's shown tremendous vulnerability--hardly the behavior we'd expect of a K'vithian, especially a Foremost. There's a *reason* he did so. He wants something."

"At what cost?" Mashkith shivered. As though observing with Keizo's trained eye, the motion looked unnatural. Contrived. A human gesture learned for a human audience.

Corinne Elman, still perched on a recongealed lump, leaned in close. "What do you mean?"

"In this place we stored the fuel for our return flight. Had our luck been only a bit worse, we would all have died instantly. Instead, we had only a moment to act. All the fuel canisters were ejected into space before the catastrophe that could have been a million times worse.

"Without antimatter from the UP, we are stranded."

* * * *

The dream was weird, as dreams often are. There were marines in a Plexiglas castle, flying dragons, quests and relics, moats filled with magnets. Thud ... thud ... thud ... pounded something against the raised drawbridge. A battering ram?

Only Art was awake now, the dream fading, and the noises continued. His bedside clock said 3:17. Someone was thumping on his cabin door. Vaguely he knew it had been going on for some time. Stifling a yawn, Art opened the door.

Chung stood in the hall, fist poised to pound some more. He had obviously been up all night. "You warned me, and I didn't listen. Now the Foremost sandbags me in a pay-per-view *interview*. Find out what's going on. What they know. What they want. What they'll trade.

"Whatever you need--it's yours."

Then Chung departed, as abruptly as he'd arrived. With him went all thoughts of sleep.

To be continued.

* * * *

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