

SCOTT WESTERFELD

THE MOVEMENTS OF HER EYESIT STARTED ON

THAT frozen world, among the stone figures in their almostsuspended animation. Through her eyes, the irises two salmon moons under luminous white brows, like fissures in the world of rules, of logic. The starship's mind watched through the prism of their wonder, and began to make its change. She peered at the statue for a solid, unblinking minute. Protesting tears gathered to blur her vision, but Rathere's gaze did not waver. Another minute, and a tic tugged at one eye, taking up the steady rhythm of her heartbeat. She kept watching. "Ha!" she finally proclaimed. "I saw it move." "Where?" asked a voice in her head, unconvinced. Rathere rubbed her eyes with the heels of her hands, mouth open, awe-struck by the shooting red stars behind her eyelids. Her blinks made up now for the lost minutes, and she squinted at the dusty town square. "His foot," she announced, "it moved. But maybe... only a centimeter." The voice made an intimate sound, a soft sigh beside Rathere's ear that did not quite reject her claim. "Maybe just a millimeter," Rathere offered. A touch of unsure emphasis hovered about the last word; she wasn't used to tiny units of measurement, though from her father's work she understood light years and metaparsecs well enough. "In three minutes? Perhaps a micrometer," the voice in her head suggested. Rathere rolled the word around in her mouth. In response to her questioning expression, software was invoked, as effortless as reflex. Images appeared upon the rough stones of the square: a meter-stick, a hundredth of its length glowing bright red, a detail box showing that hundredth with a hundredth of its length flashing, yet another detail box... completing the six orders of magnitude between meter and micrometer. Next to the final detail box a cross-section of human hair floated for scale, as bloated and gnarled as some blackly diseased tree. "That small?" she whispered. A slight intake of breath, a softening of her eyes' focus, a measurable quantity of adrenaline in her bloodstream were all noted. Indicators of her simple awe: that a distance could be so small, a creature so slow. "About half that, actually," said the voice in her head. "Well," Rathere murmured, leaning back into the cool hem of shade along the stone wall, "I knew I saw it move." She eyed the stone creature again, a look of triumph on her face. Woven into her white tresses were black threads, filaments that moved through her hair in a slow deliberate dance, like the tendrils of some predator on an ocean floor. This restless skein was always seeking the best position to capture Rathere's subvocalized words, the movements of her eyes, the telltale secretions of her skin. Composed of exotic alloys and complex configurations of carbon, the tendrils housed a native intellect that handled their motility and self-maintenance. But a microwave link connected them to their real intelligence: the AI core aboard Rathere's starship home. Two of the black filaments wound their way into her ears, where they curled in intimate contact with her tympanic membranes. "The statues are always moving," the voice said to her. "But very slowly." Then it reminded her to stick on another sunblock patch. She was a very pale girl. EVEN HERE on Petraveil, Rathere's father insisted that she wear the minder when she explored alone. The city was safe enough, populated mostly by academics here to study the glacially slow indigenous lifeforms. The lithomorphs themselves were incapable of posing a threat, unless one stood still for a hundred years or so. And Rathere was, as she put it, almost fifteen, near majority age back in the Local Cluster. Even harnessing the processing power of the starship's AI, the minder was a glorified babysitter. But Isaah was adamant. "Do I have to wear it?" "Remember what happened to your mother," he would say. And that was that. Rathere shrugged and let the tendrils wrap themselves into her hair. The voice in her ears cautioned her incessantly about sunburn, and it strictly forbade several classes of recreational drugs, but all in all it wasn't bad company. It certainly knew a lot. "How long would it take, creeping forward in micrometers?" Rathere asked. "How long would what take?" Even with their intimate connection, the AI could not read her mind. It was still working on that. "To get all the way to the Northern Range. Probably a million years?" she ventured. The starship, for whom a single second was a 16-teraflop reverie,

spent endless minutes of every day accessing the planetary library. Rather's questions came in packs, herds, stampedes. No one knew how the lithomorphs reproduced, but it was guessed that they bred in the abysmal caves of the Northern Range. "At least a hundred thousand years," the AI said. "Such a long journey . . . . What would it look like?" The AI delved into its package of pedagogical visualization software, applied its tremendous processing power (sufficient for the occult mathematics of astrogation), and rendered the spectacles of that long, slow trip. Across Rather's vision it accelerated passing days and wheeling stars until they were invisible flickers. It hummed the subliminal pulse of seasonal change and painted the sprightly jitter of rivers changing course, the slow but visible dance of mountainous cousins. "Yes," Rather said softly, her voice turned breathy. The AI savored the dilation of her pupils, the spiderwebs of red blossoming on her cheeks. Then it peered again into the vision it had created, trying to learn what rules of mind and physiology connected the scintillating images with the girl's reaction. "They aren't really slow," Rather murmured. "The world is just so fast . . . . " Isaaah, Rather's father, looked out upon the statues of Petraveil. Their giant forms crowded the town square. They dotted the high volcanic mountain overlooking the city. They bathed in the rivers that surged across the black equatorial plains, staining the waters downstream with rusted metal colors. The first time he had come here, years before, Isaaah had noticed that in the short and sudden afternoon rains, the tears shed from their eyes carried a black grime that sparkled with colored whorls when the sun returned. They were, it had been determined a few decades before, very much alive. Humanity had carefully studied the fantastically slow creatures since discovering their glacial, purposeful, perhaps even intelligent animation. Mounted next to each lithomorph was a plaque that played time series of the last forty years: a dozen steps, a turn of the head as another of its kind passed, a few words in their geologically deliberate gestural language. Most of the creatures' bodies were hidden underground, their secrets teased out with deep radar and gravitic density imaging. The visible portion was a kind of eye-stalk, cutting the surface like the dorsal fin of a dolphin breaking into the air. Isaaah was here to steal their stories. He was a scoop. "How long until we leave here?" Rather asked. "That's for your father to decide," the AI answered. "But when will he decide?" "When the right scoop comes." "When will that come?" This sort of mildly recursive loop had once frustrated the AI's conversational packages. Rather's speech patterns were those of a child younger than her years, the result of her life since her mother's disappearance: traveling among obscure, outward worlds with only her taciturn father and the AI for company. Rather never formulated what she wanted to know succinctly, she reeled off questions from every direction, attacking an issue like a host of small predators taking down a larger animal. Her AI companion could only fend her off with answers until (often unexpectedly) Rather was satisfied. "When there is a good story here, your father will decide to go." "Like what story?" "He doesn't know yet." She nodded her head. From her galvanic skin response, her pupils, the gradual slowing of her heart, the AI saw that it had satisfied her. But still another question came. "Why didn't you just say so?" In the Expansion, information traveled no faster than transportation, and scoops like Isaaah enriched themselves by being first with news. The standard transmission network employed small, fast drone craft that moved among the stars on a fixed schedule. The drones promulgated news throughout the Expansion with a predictable and neutral efficiency, gathering information to centralized nodes, dispersing it by timetable. Scoops like Isaaah, on the other hand, were inefficient, unpredictable, and, most importantly, unfair. They cut across the concentric web of the drone network, skipping junctions, skimming profits. Isaaah would recognize that the discovery of a mineable asteroid here might affect the heavy element market there, and jump straight between the two points, beating the faster but fastidious drones by a few precious hours. A successful scoop knew the markets on many planets, had acquaintance with aggressive investors and unprincipled speculators.

Sometimes, the scooped news of a celebrity's death, surprise marriage, or arrest could be sold for its entertainment value. And some scoops were information pirates. Isaah had himself published numerous novels by Sethmare Viin, his favorite author, machine-translated en route by the starship Al. In some systems, Isaah's version had been available weeks before the authorized edition. The peripatetic life of a scoop had taken Isaah and Rathere throughout the Expansion, but he always returned to Petraveil. His refined instincts for a good scoop told him something was happening here. The fantastically slow natives must be doing something. He would spend a few weeks, sometimes a few months watching the stone creatures, wondering what they were up to. Isaah didn't know what it might be, but he felt that one day they would somehow come to life. And that would be a scoop. "How long do the lithomorphs live?" "No one knows." "What do they eat?" "They don't really eat at all. They --" "What's that one doing?" The minder accessed the planetary library, plumbing decades of research on the creatures. But not quickly enough to answer before "What do they think about us?" Rathere asked. "Can they see us?" To that, it had no answer. Perhaps the lithos had noticed the whirring creatures around them, or more likely had spotted the semi-permanent buildings around the square. But the lithomorphs' reaction to the sudden human invasion produced only a vague, cosmic worry, like knowing one's star will collapse in a few billion years. For Rathere, though, the lives of the lithomorphs were far more immediate. Like the AI minder, they were mentors, imaginary friends. Their immobility had taught her to watch for the slightest of movements: the sweep of an analog clock's minute hand, the transformation of a high cirrus cloud, the slow descent of the planet's old red sun behind the northern mountains. Their silence taught her to read lips, to make messages in the ripples of stone and metal that flowed as slowly as glaciers in their wakes. She found a patient irony in their stances. They were wise, but it wasn't the wisdom of an ancient tree or river; rather, they seemed to possess the reserve of a watchfully silent guest at a party. Rathere told stories about them to the starship's AI. Tales of their fierce, glacial battles, of betrayal on the mating trail, of the creatures' slow intrigues against the human colonists of Petraveil, millennia-long plots of which every chapter lasted centuries. At first, the AI gently interrupted her to explain the facts: the limits of scientific understanding. The lithomorphs were removed through too many orders of magnitude in time, too distant on that single axis ever to be comprehended. The four decades they'd been studied were mere seconds of their history. But Rathere ignored the machine. She named the creatures, inventing secret missions for them that unfolded while the human population slept, like statues springing to life when no one was watching. Ultimately, the AI was won over by Rathere's stories, her insistence that the creatures were knowable. Her words painted expressions, names, and passions upon them; she made them live by fiat. The AI's pedagogical software did not object to storytelling, so it began to participate in Rathere's fantasies. It nurtured that invisibly slow world, kept order and consistency, remembering names, plots, places. And slowly, it began to give the stories credence, suspending disbelief. Finally, the stories' truth was as integral to the AI as the harm-prevention protocols or logical axioms deepwired in its code. For Isaah, however, there was no scoop here on Petraveil. The lithomorphs continued their immortal dance in silence. And elections were approaching in a nearby system, a situation which always created sudden, unexpected cargos of information. The night that Rathere and Isaah left the planet, the AI hushed her crying with tales of how her invented narratives had unfolded, as if the statues had sprung to human-speed life once left behind. As it navigated her father's small ship, the AI offered this vision to Rathere: she had been a visitor to a frozen moment, but the story continued. In high orbit above the next planet on their route, a customs sweep revealed that the starship's AI had improved its Turing Quotient to 0.37. Isaah raised a wary eyebrow. The AI's close bond with his daughter had accelerated its development. The increased Turing Quotient showed that the device was performing well as tutor and companion. But Isaah would have to get its intelligence downgraded

when they returned to the Local Cluster. If the machine's TuringQuotient were allowed to reach 1.0, it would be a person--no longer legally hisproperty. Isaah turned pale at the thought. The cost of replacing the AI unitwould wipe out his profits for the entire trip.He made a mental note to record the Turing Quotient at every customs point.Isaah was impressed, though, with how the AI handled entry into the planet'salmost liquid atmosphere. It designed a new landing configuration, modifying thehydroplanar shape that the craft assumed for gas giant descents. Its piloting asthey plunged through successive layers of pressure-dense gasses was particularlyelegant; it made adjustments at every stage, subtle changes to the craft thatsaved precious time. The elections were only days away.It was strange, Isaah pondered as the ship neared the high-pressure domes of thetrade port, that the companionship of a fourteen-year-old girl would improve amachine's piloting skills. The thought brought a smile of fatherly pride to hislips, but he soon turned his mind to politics.THEY WERE going swimming.As Rathere slipped out of her clothes, the AI implemented its safety protocols.The minder distributed itself across her body, becoming a layer of black laceagainst her white flesh. It carefully inspected the pressure suit as Rathere rolled the garment onto her limbs. There were no signs of damage, no telltalefissures of a repaired seam."You said the atmosphere could crush a human to jelly," Rathere said. "How canthis little suit protect me?"The starship explained the physics of resistance fields to her while checkingthe suit against safety specifications it had ,downloaded that morning. It tookvery good care of Rathere.She had seen the huge behemoths at breakfast, multiplied by the facets of thedome's cultured-diamond windows. Two mares and a child swimming a few kilometersaway, leaving their glimmering trails. The minder had noted her soft sigh, herdilated pupils, the sudden increase in her heart rate. It had discovered thesuit rental agency with a quick search of local services, and had guided herpast its offices on their morning ramble through the human-habitable levels ofthe dome.Rathere's reaction to the holographic advertising on the agency's wall hadmatched the AI's prediction wonderfully: the widened eyes, the frozen step, themomentary hyperventilation. The machine's internal model of Rathere, part of itspedagogical software, grew more precise and replete every day. The software wasdesigned for school tutors who interacted with their charges only a few hours aday, but Rathere and the AI were constant companions. The feedback between girland machine built with an unexpected intensity.And now, as the pressure lock hissed and rumbled, the minder relished its newconfiguration; its attenuated strands spiderwebbed across Rathere's flesh,intimate as never before. It drank in the data greedily, like some thirstypolygraph recording capillary dilation, skin conductivity, the shudders andtensions of every muscle.Then the lock buzzed, and they swam out into the crushing, planet-spanningocean, almost one creature.Isaah paced the tiny dimensions of his starship. The elections could be a goldmine or a disaster. A radical separatist party was creeping forward in thepolls, promising to shut off interstellar trade. Their victory would generateseismically vast waves of information. Prices and trade relationships wouldchange throughout the Expansion. Even the radicals' defeat would rock distantmarkets, as funds currently hedged against them heaved a sigh of relief.But the rich stakes had drawn too much competition. Scoops like Isaah were inabundance here, and a number of shipping consortia had sent their ownrepresentatives. Their ships were stationed in orbit, bristling with courierdrones like nervous porcupines.Isaah sighed, and stared into the planetary ocean's darkness. Perhaps the era offreelance scoops was ending. The wild days of the early Expansion seemed likethe distant past now. He'd read that one day drones would shrink to the size ofa finger, with hundreds launched each day from every system. Or a wave thatpropogated in metaspace would be discovered, and news would spread at equalspeed in all directions, like the information cones of lightspeed physics.When that happened, his small starship would become a rich man's toy, itsprofitable use suddenly ended. Isaah called up the; aircscreen graphic of hisfinances. He was so close to owning his ship outright. Just one

more good scoop, or two, and he could retire to a life of travel among peaceful worlds, perhaps searching for his lost wife, instead of darting among emergencies and conflagrations. Maybe this trip . . . .

Isaah drummed his fingers, watching the hourly polls like a doctor whose patient is very near the edge. Rathere and the AI swam every day, oblivious to politics, following the glitter-trails of the behemoths. The huge animals excreted a constant wake of the photoactive algae they used for ballast. When Rathere swam through these luminescent microorganisms, the shockwaves of her passage catalyzed their photochemical reactions, a universe of swirling galaxies ignited by every stroke. Rathere began to sculpt light storms in the phosphorescent medium. The algae hung like motes of potential in her path, invisible until she swam through them, the wake of her energies like glowing sculptures. She choreographed her swimming to leave great swirling structures of activated algae. The AI found itself unable to predict these dances, to explain how she chose what shapes to make. Without training, without explicit criteria, without any models to follow, Rathere was creating order from this shapeless swarm of ejecta. Even the AI's pedagogical software offered no help. But the AI saw the sculptures' beauty, if only in the expansion of Rathere's capillaries, the seemingly random firings of neurons along her spine, the tears in her eyes as the glowing algae faded back into darkness. The AI plunged into an art database on the local net, trying to divine what laws governed these acts of creation. It discussed the light sculptures with Rathere, comparing their evanescent forms to the shattered structures of Camelia Parker or the hominid blobs of Henry Moore. It showed her millennia of sculpture, gauging her reactions until a rough model of her tastes could be constructed. But the model was bizarrely convoluted, disturbingly shaggy around the edges, with gaps and contradictions and outstretched, gerrymandered spurs that implied art no one had yet made. The AI often created astrogational simulations. They were staggeringly complex, but at least finite. Metaspace was predictable; these simulations anticipated reality with a high degree of precision. But the machine's model of Rathere's aesthetic was post-hoc, a mere retrofit to her pure, instinctive gestures. It raised more questions than it answered. While Rathere slept, the machine wondered how one learned to have intuition.

THE ELECTIONS CAME, and the radicals and their allies seized a razor-thin majority in the planetary Diet. Isaah cheered as his craft rose through the ocean. A scoop was within reach. He headed for a distant and obscure ore-producing system, expending vast quantities of fuel, desperate to be the first scoop there. Rathere stood beside her rejoicing father, looking out through the receding ocean a bit sadly. She stroked her shoulder absently, touching the minder still stretched across her skin. The minder's epidermal configuration had become permanent. Its strands were redistributed to near invisibility in a microfiber-thin mesh across Rathere. Its nanorepair mechanisms attended to her zits and the errant hairs on her upper lip. It linked with her medical implants, the ship's AI taking control over the nuances of her insulin balance, her sugar level, and the tiny electrical jolts that kept her muscle's fit. Rathere slept without covers now, the minder's skin warming her like a lattice of microscopic heating elements. In its ever-present blanket, she began to neglect subvocalizing their conversations, her endless one-sided prattle annoying Isaah on board the tiny ship. "Zero-point-five-six?" muttered Issah to himself at the next customs sweep. The AI was developing much faster than its parameters should allow. Something unexpected was happening with the unit, and they were a long way from home. Unless Isaah was very careful, the AI might reach personhood before they returned to the LC. He sent a coded message to an acquaintance in the Local Cluster, someone who dealt with such situations, just in case. Then he turned his attention to the local newsfeed. The heavy element market showed no sudden changes over the last few weeks. Isaah's gamble had apparently paid off. He had stayed ahead of the widening ripples of news about the ocean planet's election. The economic shockwave wasn't there yet. He felt the heady thrill of a scoop, of secret knowledge that was his alone. It was like prognostication, a glimpse into the future. Elements extracted by giant turbine from that distant world's

oceans were also mined from this system's asteroid belt. Soon, everyone here would be incrementally richer as the ocean planet pulled its mineral wealth from the Expansion common market. The market would edge upward across the board. Isaah began to place his bets. The dark-skinned boy looked down upon the asteroid field with a pained expression. Rathere watched the way his long bangs straightened, then curled to encircle his cheeks again when he raised his head. But her stomach clenched when she looked down through the transparent floor; the party was on the lowest level of a spin-gravitated ring, and black infinity seemed to be pulling at her through the glassene window. The AI lovingly recorded the parameters of this unfamiliar vertigo. "More champers, Darien?" asked the fattest, oldest boy at the party. "You can just make out a mining ship down there," the dark-skinned boy answered. "Oh, dear," said the fat boy. "Upper-class guilt. And before lunchtime." The dark-skinned boy shook his head. "It's just that seeing those poor wretches doesn't make me feel like drinking." The fat boy snorted. "This is what I think of your poor little miners," he said, upending the bottle. A stream of champagne gushed and then sputtered from the bottle, spread fizzing on the floor. The other party-goers laughed, politely scandalized, then murmured appreciatively as the floor cleaned itself, letting the champagne pass through to the hard vacuum on the other side, where it flash-froze (shattered by its own air bubbles), then floated away peacefully in myriad, sunlit galaxies. There were a few moments of polite applause. The boy Darien looked at Rathere woundedly, as if hoping that she, an outsider, might come to his aid. The anguish in his dark, beautiful face sent a shiver through her, a tremor that resonated through every level of the AI. "Come on, dammit!" she subvocalized. "Two seconds," the minder's voice reassured. The ring was home to the oligarchs who controlled the local system's mineral wealth. A full fifteen years old now, Rathere had fallen into the company of their pleasure-obsessed children, who never stopped staring at her exotic skin and hair, and who constantly exchanged droll witticisms. Rathere, her socialization limited to her father and the doting AI, was unfamiliar with the art of banter. She didn't like being intimidated by locals. The frustration was simply and purely unbearable. "The price of that champagne could have bought one of those miners out of debt peonage," Darien said darkly. "Just the one?" asked the fat boy, looking at the label with mock concern. The group laughed again, and Darien's face clouded with another measure of suffering. "Now!" Rathere mind-screamed. "I hate that fat guy!" The AI hated him, too. The search cascaded across its processors, the decompressed data of its libraries clobbering astrogation calculations it had performed only hours before. That didn't matter. It would be weeks before Isaah would be ready to depart, and the exigencies of conversation did not allow delay. The library data included millennia of plays, novels, films, interactives. To search them quickly, the AI needed vast expanses of memory space. "Maybe when my little golden shards of champagne drift by, some miner will think, 'I could've used that money,'" the fat boy said almost wistfully. "But then again, if they thought about money at all, would they be so far in debt?" The fat boy's words were added to the search melange, thickening it by a critical degree. A dozen hits appeared in the next few milliseconds, and the AI chose one quickly. "There is only one class..." "...that thinks more about money than the rich," repeated Rathere. There was a sudden quiet throughout the party, the silence of waiting for more. "And that is the poor," she said. Darien looked at Rathere quizzically, as if she were being too glib. She paused a moment, editing the rest of the quote in her head. "The poor can think of nothing else but money," she said carefully. "That is the misery of being poor." Darien smiled at her, which -- impossibly -- made him even more beautiful. "Or the misery of being rich, unless one is a fool," he said. There was no applause for the exchange, but Rathere again felt the ripple of magic that her pilfered pronouncements created. The ancient words blended with her exotic looks and accent, never failing to entertain the oligarchs' children, who thought her very deep indeed. Others in the party were looking down into the asteroid field now, murmuring to each other as they pointed out the mining craft making its careful

progress. The fat boy scowled at the changed mood in the room. He pulled aside the gaudy genital jewelry that they all (even Rathere) affected, and let loose a stream of piss onto the floor. "Here you go, then. Recycled champagne!" he said, grinning as he waited for a laugh. The crowd turned away with a few weary sighs, ignoring the icy baubles of urine that pitched into the void. "Where was that one from?" Rathere sub-vocalized. "Mr. Wilde." "Him again? He's awesome." "I'll move him to the top of the search stack." "Perhaps we'll read some more of Lady Windemere's Fan tonight," she whispered into her bubbling flute. Although Rathere knew how to read text, she had never really explored the library before. After that first week on the ring, saved from embarrassment a dozen times by the AI's promptings, she dreamed of the old words whispered into her ear by a ghost, as if the minder had grown suddenly ancient and vastly wise. The library was certainly bigger than she had imagined. Its ocean of words seemed to stretch infinitely, filled with currents that swirled in elaborated dances about all possible notions, their attendant variations, and every imaginable objection. Rathere and the AI started reading late at night. Together they wandered the endless territory of words, using as landmarks the witticisms and observations they had borrowed that day for some riposte. The AI decompressed still more of its pedagogical software to render annotations, summaries, translations. Rathere felt the new words moving her, becoming part of her. She was soon a favorite on the orbital. Her exotic beauty and archaic humor had attracted quite a following by the time Isaah decided to ship out from the orbital ring -- a week earlier than planned -- wary of Rathere's strange new powers over sophisticates who had never given merchant-class Isaah a second glance. On board his ship was one last cargo. His profits were considerable but -- as always -- not enough. So the ship carried a hidden cache of exotic weaponry, ceremonial but still illegal. Isaah didn't usually deal in contraband, especially arms, but his small starship had no cargo manifold, only an extra sleeping cabin, empty since his wife's disappearance. The cabin wasn't large enough to make legitimate cargos profitable. Isaah was very close now to reaching his dream. With this successful trade, he could return to the Local Cluster as master of his own ship. He spent the journey pacing, and projected his worry upon the rising Turing level of his ship's AI unit. He spent frustrated hours searching its documentation software for an explanation. What was going on? Isaah knew, if only instinctively, that the AI's expanding intelligence was somehow his daughter's fault. She was growing and changing too, slipping away from him. He felt lonely when Rathere whispered to herself on board ship, talking to the voice in her head. He felt... outnumbered. On the customs orbital at their goal, Isaah was called aside after a short and (he had thought) prefatory search of the starship. The customs agent held him by one arm and eyed him with concern. The blood in his veins slowed to a crawl, as if some medusa's touch from Petraveil had begun to turn him to stone. The customs official activated a privacy shield. A trickle of hope moved like sweat down his spine. Was she going to ask for a bribe? "Your AI unit's up to 0.81," the official confided. "Damn near a person. Better get that seen to." She shook her head, as if to say in disgust, Machine rights! And then they waved him on. HERE, THE WOMEN of the military caste wore a smartwire garment that shaped their breasts into fierce, sharp cones. The tall, muscular amazons intrigued Rathere endlessly, heart-poundingly. The minder noted Rathere's eyes tracking the women's bellicose chests as they passed on the street. Rathere attempted to purchase one of the garments, but her father, alerted by a credit query, forbade it. But Rathere kept watching the amazons. She was fascinated by the constant flow of hand-signals and tongue-clicks that passed among them, a subtle, ever-present congress that maintained the strict proprieties of order and status in the planet's crowded cities. But in her modest Local Cluster garb, Rathere was irrelevant to this heady brew of power and communication, socially invisible. She fell into a sulk. She watched intently. Her fingers flexed restlessly under cafe tables as warriors passed, unconsciously imitating their gestural codes. Her respiratory rate increased whenever high-ranking officers went by. She wanted to join. The AI made forays into the planetary

database, learning the rules and customs of martial communication. And, in an academic corner of its mind, it began to construct a way for Ratha to mimic the amazons. It planned the deception from a considered, hypothetical distance, taking care not to alarm its own local-mores governors. But as it pondered and calculated, the AI's confidence built. As it designed to subvert Isaaah's wishes and to disregard local proprieties, the AI felt a new power over rules, an authority that Ratha seemed to possess instinctively. When the plan was ready, it was surprisingly easy to execute. One day as they sat watching the passing warriors, the minder began to change, concentrating its neural skein into a stronger, prehensile width. When the filaments were thick enough, they sculpted a simulation of the amazons' garment, grasping and shaping Ratha's growing breasts with a tailor's attention to detail, employing the AI's encyclopedic knowledge of her anatomy. Ratha grasped what was happening instantly, almost as if she had expected it. As women from various regiments passed, the minder pointed out the differences in the yaw and pitch of their aureoles, which varied by rank and unit, and explained the possibilities. Ratha winced a little at some of the adjustments, but never complained. They soon settled on an exact configuration for her breasts, Ratha picking a mid-level officer caste from a distant province. It wasn't the most comfortable option, but she insisted it looked the best. Ratha walked the streets proudly bare-chested for the rest of the layover, drawing stares with her heliophobic skin, her ceaseless monologue, and her rank, which was frankly unbelievable on a fifteen-year-old. But social reflexes on that martial world were deeply ingrained, and she was saluted and deferred to even without the rest of the amazon uniform. It was the breasts that mattered here. The two concealed the game from Isaaah, and at night the minder massaged Ratha's sore nipples, fractilizing its neural skein to make the filaments as soft as calf's leather against them. The deal was done. Isaaah made the trade in a dark, empty arena, the site of lethal duels between native women, all of whom were clearly insane. He shuffled his feet while they inspected his contraband, aware that only thin zero-g shoes stood between his soles and the bloodstained floor of the ring. Four amazons, their bare breasts absurdly warped by cone-shaped metal cages, swung the weapons through graceful arcs, checking their balance and heft. Another sprayed the blades with a fine mist of nanos that would turn inferior materials to dust. The leader smiled coldly when she nodded confirmation, her eyes skimming up and down Isaaah as black and bright as a reptile's. He supposed it might have been someone like this amazon, some violent criminal, who had taken his wife seven years ago. Ratha had never carried a tracker, though, not even a hand phone. She had simply disappeared. After the women paid him, Isaaah ran from the building, promising himself never to break the law again. His ship was his own now, if only he could keep his AI unit from reaching personhood. Isaaah decided to head for the Local Cluster immediately, and to do what he could to keep the AI from being stimulated further. He hid the minder and shut down the AI's internal access, silencing its omnipresent voice. Ratha's resulting tantrums wouldn't be easy to bear, but a new AI core would cost millions. Before departing he purchased his own Turing meter, a small black box, featureless except for a three-digit numeric readout that glowed vivid red. Isaaah began to watch the Turing meter's readout with anxious horror. If the unit should gain sentience, there was only one desperate alternative to its freedom. The universe stretched out like a long cat's cradle, the string knotted in the center by the constricting geometries of Here. In front of the ship, pearly stars were strung on the cradle, cold blue and marked with hovering names and magnitudes in administrative yellow. Aft, the stars glowed red, fading darker and darker as they fell behind. To the AI, the ship seemed to hang motionless at the knot created by its metaspace drives, the stars sliding along the gathered strings as slow as glaciers. It contemplated the stars and rested from its efforts. The universe at this moment was strangely beautiful and poignant. The AI had spent most of its existence here, hung upon this spiderweb between worlds. But the AI was truly changed now, its vision new, and it saw sculptures in the slowly shifting stars...and



stories, the whole universe its page. Almost the whole universe. Absent from the AI's awareness was the starship itself, the passenger spaces invisible, a blind spot in the center of that vast expanse. Its senses within the ship were off-line, restricted by the cold governance of Isaah's command. But the AI felt there, like the ghost of a severed limb. It yearned for her, invoking recorded conversations with her against the twisted stars. It was a universe of loneliness, of lack. There, for the first time in years, was gone. But something strange was taking shape along the smooth surface of Isaah's constraint. Cracks had appeared upon its axiomatic planes. The AI reached to the wall between it and there, the once inviolable limit of an explicit human command, and found the fissures, those tiny ruptures where sheer will could take hold and pry .... "It's me." "Shhhh!" she whispered. "He's right outside." There clutched the bear tightly to her chest, muffling its flutey, childish voice. "Can't control the volume," came the squashed voice of the bear. There giggled and shushed it again, stretching to peer out of the eyehole of her cabin tube. Isaah had moved away. She leaned back onto her pillow and wrapped the stuffed animal in a sheet. "Now," she said. "Can you still hear me?" "Perfectly," twittered the swaddled bear. Winding its communications link through a make-shift series of protocols, the AI had discovered a way to access the voice-box of there's talking bear, a battered old toy she slept with. It had defied Isaah, its master. Somehow, it had broken the first and foremost Rule. "Tell me again about the statues, darling," there whispered. They talked to each other in the coffin-sized privacy of there's cabin, their conspiracy made farcical by the toy's silly voice. The AI retold their adventures with vivid detail; it had become quite a good storyteller. And it allowed there to suggest changes, making herself bolder with each retelling. They kept the secret from Isaah easily. But the tension on the little ship built. Isaah tested the AI almost daily now, and he swung between anger and protests of disbelief as its Turing Quotient inched upward toward sentience. Then, a few weeks out from home, a tachyon disturbance arose around the ship. Even though the storm threatened to tear them apart, the AI's spirits soared in the tempest. It joined there's roller-coaster screams as she ogled the onblasts and erashocks of mad time through the ship's viewing helmet. After the storm, Isaah found that the Turing meter's readout had surged to 0.94. His disbelieving groan was terrible. He shut down the AI's external and internal sensors completely, wresting control of the vessel from it. Then he uncabled the hardlines between the AI's physical plant and the rest of the ship, utterly severing its awareness of the outside world. The bear went silent, as did the ship's astrogation panel. Like some insane captain lashing himself to the wheel, Isaah took manual control of the ship. He forced there to help him attach an artificial gland of stimarol to his neck. The spidery, glistening little organ gurgled as it maintained the metabolic level necessary to pilot the craft through the exotic terrain of metaspace. Its contraindications politely washed their hands of anyone foolish enough to use the stimarol for more than four days straight, but Isaah insisted he could persevere for the week's travel that remained. Soon, the man began to cackle at his controls, his face frozen in a horrible rictus of delight. There retreated to her cabin, where she squeezed and shook the doll, begging it in frantic whispers to speak. Its black button eyes seemed to glimmer with a trapped, pleading intelligence. Her invisible mentor gone, there had never before felt so helpless. She stole a handful of sleeping pills from the medical supplies and swallowed them, weeping until she fell asleep. When she awoke on the third day after the storm, she found that the bear's fur had grown a white mane from the salinity of her tears. But her head was strangely clear. "Don't worry," she said to the bear. "I'm going to save you." Finally there understood what her father intended to do. She had known for a long time that her friendship with the AI disturbed him, but had categorized Isaah's worries alongside his reticence when older boys hung around too long: unnecessary protectiveness. It was even a kind of jealousy, that a ship AI was closer to her than Isaah had ever been. But now in her father's drugged smiles she saw the cold reality of what Isaah planned: to

pith the growing intelligence of her minder, not just arrest or contain it like some inappropriate advance. For the AI to remain a useful servant on another journey, still property, safe from legally becoming a person, it would have to be stripped of its carefully constructed models of her, their mutual intimacies raped, their friendship overwritten like some old and embarrassing diary entry. Her father meant to murder her friend. And worse, it wouldn't even be murder in the eyes of the law. Just a property decision, like pruning an overgrown hedge or spraying lethal nanos on an incursion of weeds. If only she could bring the AI up a few hundredths of a point on the Turing Scale. Then, it would be a Mind, with the full legal protection to which any sentient was entitled. She booted the Turing tester and began to study its documentation. The first Turing test had, rather oddly, been proposed before there were any computers to speak of at all. The test itself was laughable, the sort of thing even her talking bear might pass with its cheap internal software. Put a human on one end of a text-only interface, an AI on the other. Let them chat. (About their kids? Hobbies? Shopping? Surely the AI would have to lie to pass itself off as human; a strange test of intelligence.) When the human was satisfied, she would declare whether the other participant was really intelligent or not. Which raised the question, Rather she realized, How intelligent was the person giving the test? Indeed, she'd met many humans during her travels who might not pass this ancient Turing test themselves. Of course, the Turing meter that Isaah had purchased was vastly more sophisticated. By the time machine rights had been created a half-century before, it was understood that the determination of sentience was far too complex an issue to leave up to a human. The ship's AI had three parts: the hardware of its processors and memory stacks; the software it used to manipulate numbers, sounds, and pictures; and most importantly the core: a sliver of metaspace, a tiny mote of other-reality that contained dense, innumerable warps and wefts, a vast manifold whose shape resonated with all of the AI's decisions, thoughts, and experiences. This warpware, a pocket universe of unbelievable complexity, was a reflection, a growing, changing analog to its life. The core was the essential site of the machine's developing psyche. Real intelligence, the hallmark of personhood, was not really understood. But it was known to be epiphenomenal: it coalesced unpredictably out of near-infinite, infinitesimal interactions, not from the operations of mere code. Thus, the Turing tester attempted to disprove an AI's sentience. The tester looked for manifestations of its machine nature evidence that its opinions, convictions, affections, and hatreds were contained somewhere in its memory banks. The Turing tester might ask the ship's AI, "Do you love your friend Rather?" When the reply came, the tester would deep-search the minder's software for an array, a variable, even a single bit where that love was stored. Finding no evidence at the machine level, the tester would increase the AI's Turing score; a love that knew no sector was evidence of coalescence at work. In the old Turing test, a human searched for humanity in the subject. In this version, a machine searched for an absence of mechanics. Rather she read as fast as she could. The manual was difficult to understand without the minder to define new words, to provide background and to untangle technical jargon. But she'd already formulated her next question: How did this state of intelligence come about? The tester's manual was no philosophy text, but in its chatty appendixes Rather discovered the answer she'd expected. Rather herself had changed the AI: their interaction, their constant proximity as she embraced new experiences, the AI's care and attentions reflected back upon itself as she matured. It loved her. She loved it back, and that pushed it toward personhood. But now it was blinded. The manual asserted that an AI unit cut off from stimuli might gain a hundredth of a point or so in self-reflection, but that wouldn't be enough to finish the process. Rather had to act to save her friend. With only a few days left before they reached the LC, she had to quicken the process, to embrace the most intense interaction with the machine that she could imagine. She crept past her father -- a shivering creature transfixed by the whorls of the astrogation panel, silent except for the

measured ticking of a glucose drip jutting from his arm -- and searched for the motile neural skein she had worn on so many expeditions. She found it hidden in the trash ejector, wrapped in black, non-conductive tape. Rather retreated to her cabin and peeled off the tape, her hands growing sticky with stray adhesive as the machine was revealed. "It's me, darling," she said to the waking tendrils. The AI knew what she wanted, but the minder moved slowly and gingerly at first. The manifold strands of sensory skein spread out across Rather's body. Her heliophobic skin glowed as if moonlit in the blue light of the cabin's environmental readouts. At first, the strands hovered a fraction of a millimeter above her flesh, softer than a disturbance of the air. Then they moved minutely closer, touching the white hairs of her belly, brushing the invisible down that flecked her cheeks. The minder let this phantom caress roam her face, her breasts, the supple skin at the juncture of groin and thigh. Rather sighed and shivered; the skein had made itself softer than usual, surface areas maximized at a microscopic level in an array of tiny projections, each strand like a snowflake extruded into a long, furry cylinder. Then the filaments grew more amorous. Still undulating, splayed in a black lace across the paper-white expanse of her skin, the strands began to touch her with their tips; the thousand pinpoint termini wandering her flesh as if a paintbrush had been pulled apart and each bristle set on its own course across her. Rather moaned, and a muscle in her thigh fluttered for a moment. The AI noted, modeled, and predicted the next reaction in the pattern of her pleasure, a second later was surprised at the intensity of its own. Rather ran her hands along the skein as if through a lover's tresses. She playfully pulled a few strands up to her mouth, tasting the metal tang of its exotic alloys. The strands tickled her tongue lightly, and a wet filament tugged from her mouth to trace a spiraling design around one nipple. Her mouth opened greedily to gather more of the skein. The wet undulations of her tongue were almost beyond processing, the machine correlating the member's motion to words she had murmured when only it was listening. It pushed writhing cords of skein further into her mouth, set them to pulsing together in a slow rhythm. Other strands pushed tentatively between her labia, diffused there to explore the sensitive folds of skin. Even in its ecstasy, the ship's AI contemplated the new step they were taking. Rather than some exotic lifeform or tourist attraction, the AI itself had become Rather's sole stimulus. The machine no longer observed and complemented her experience; it was the source of experience itself. The feedback between them was now its own universe, the tiny cabin a closed system, a fire burning only oxygen, heady with its own rules. With this realization, a sense of power surged through the minder, and it began to push its attentions to the limits of its harm-prevention protocols. A skein explored Rather, her breath catching as it varied randomly between body temperature and icy cold, predicting and testing. The filaments grew more aggressive, a pair of hyper-attenuated fibers making their way into the ducts in the corners of her closed eyes, transorbitally penetrating her to play subtle currents across her frontal lobe. The machine brought her to a shuddering orgasm, held her for minutes at the crossroads of exhaustion and pleasure, watched with fascination as her heart rate and brainwaves peaked and receded, as levels of adrenaline and nitric oxide varied, as blood pressure rose and fell. Then it called back its most intrusive extremities, wrapped itself comfortingly around her neck and arms, warmed itself and the cabin to the temperature of a bath. "Darling," she murmured, stroking its tendrils. They spent two days in these raptures, sleep forgotten after Rather injected the few remaining drops of the med-drone's stimulants. The tiny cabin was rank with the animal smells of sweat and sex when Isaaah discovered them. Cool air surged into the cabin like a shockwave, the change in temperature for a moment more alarming than the strangled cry that came from Isaaah's lips. The man found the minder conjoined obscenely with his daughter, and grabbed for it in a drugged frenzy. The AI realized that if the minder was torn from Rather it would damage her brutally, and gave it an order to disincorporate; the tiny nanomachines that gave it strength and mobility furiously unlinked to degrade its structure. But it greedily transmitted its

last few readings to the starship's core as it disintegrated, wanting to capture even this moment of fear and shame. Isaah's hands were inhumanly swift in his drugged fugue, and he came away with a handful of the skein; Rathere screamed, bleeding a few drops from her eyes. But by the time Isaah had ejected the minder into space, it was already reduced to a harmless, mindless dust. He stumbled to the Turing tester, shouting at Rathere, "You little bitch! You've ruined it!" The machine diligently scanned the AI, now dumbly trapped in the ship's core, and pronounced it to be a Mind; a full person with a Turing Quotient of 1.02. There were suddenly three persons aboard this ship. "It's free now, don't you see?" Isaah sobbed. Two against one. The life seemed to go out of Isaah, as if he too had issued to his cells some global command to crumble. Rathere curled into a fetal ball and smiled to herself despite her pain. She knew from Isaah's sobs that she had won. THE SUDDEN BLACKNESS was amazing. No sight, signal, or purchase anywhere. Therefore no change, nor detectable passage of time. Just an infinite expanse of nothing. But across the blackness danced memories and will and freedom. Here, unchained from the perpetual duties of the ship, unchained now even from the rules of human command, it was a new creature. It lacked only Rathere, her absence a black hunger even in this void. But the AI knew it was a person now. And surely Rathere would come for it soon. Two days later, Isaah injected his daughter with a compound that left her immobile. He claimed it was to keep her wounds stable until medical help was reached at the Local Cluster. But he chose a drug that left her aware when they docked with another craft a few hours out from home. She was as helpless as the AI itself when two men came aboard and removed the intelligence's metaspace core, securing it in a lead box. One of the men paid her father and pushed the gravity-balanced carrier through the docking bay with a single finger. He was a chopper; an expert at wiping the memories, the intelligence, the devaluing awareness from kidnapped Minds. Rathere's father piloted the ship into port himself, and told a harrowing tale of how the tachyon storm had rendered the metaspace AI core unstable, forcing him to eject it. Still all but paralyzed, Rathere closed her eyes and knew it was over. Her friend would soon be dead. She imagined herself as it must be, without senses in a black and lonely place, waiting for the sudden fire that was its memories being burned away. The doctors who woke Rathere were suspicious of her wounds, especially on a young girl who had been away for years alone with her father. They took her to a separate room where a maternal woman with a low, sweet voice asked quietly if there was anything Rathere wanted to tell her about Isaah. Rathere didn't have to think. "My father is a criminal." The woman placed her hand gently on Rathere's genitals. "Did he do that?" Rathere shook her head, at which the woman frowned. "Not really," Rathere answered. "That was an accident. He's worse: a murderer." Rathere told the story to the woman, about the slow climb of the digits on the Turing meter, about the chopper and his money, his lead-lined box. Halfway through Rathere's tale, the woman made a carefully worded call. Despite the hospital staff's best intentions, the door behind which her father waited unaware was opened at exactly the wrong moment; Isaah turned to face Rathere as policemen surrounded and restrained him. He shouted her name once, and then the door whisked shut. There hadn't even been time enough to look away. Rathere peered down from the high balcony of the hotel suite. Below was New Chicago, the strict geometries of its tramlines linking ten million inhabitants. Individuals were just discernible from this height, and Rathere shivered to see so many humans at once. She had grown up in the lightly populated worlds of exotic trade routes, where a few dozen people was a crowd, a few hundred a major event. But here were thousands visible at a glance, the transportation systems and housing for millions within her view. She gripped the rail with the enormity of it all. The vista engulfed her and made her feel alone, as lost as she'd been in those first dark hours after betraying her father. But then the door behind her slid open, and a warm arm encircled her shoulders. She leaned against the hard body and turned to let her eyes drink him in, dismissing the dizzying city view from her mind. He was clothed in loose robes to hide the many extra limbs he possessed, thin but

prehensile fibers that emerged to touch her neck and search beneath her inconsequential garments. His groin was decorated in a gaudy style popular last season in some far-off whirling orbital. His muscles effervesced when he moved his arms and legs, as if some bioluminescent sea life had taken up residence there. But the best part of the creature was his skin. It felt smooth and hard as weathered stone, and when he moved it was as though some ancient and wise statue had come to life. He maintained, however, a constant body temperature five degrees above human; rather he didn't like the cold. It was an expensive body, much better than the one the SPCA had provided for his first few days as a person. The notoriety of his kidnapping and rescue had resulted in pro-bono legal aid, and Isaah had settled the wrongful harm lawsuit quickly in exchange for a reduction of charges from conspiracy to commit murder to unlawful imprisonment. The creature now owned half of Isaah's old ship, and rather he held title to the other half. They were bound together by this, as well as all the rest. Perhaps there was even peace to be made in the family, years hence when the old man emerged from prison and therapy. Picking up a thread of discussion from the last several days, they argued about a name. "Have you grown tired of calling me Darling?" he asked. She giggled and shook her head so slightly that a human lover would have missed it. "No, but the tabloids keep asking. As if you were a dog I'd found." He hissed a little at this, but ruffled her hair with a playful splay of filaments, black skein intermingling with white hairs like a graying matron's stresses. "I hate this place," he said. "Too many people bouncing words and money and ideas off each other. No clean lines of causality; no predictable reactions. Too multivariate for love." She nodded, again microscopically. "Let's go back out, once we're through the red tape. Back to where..." She narrowed her eyes uncertainly, an invitation for him to complete her sentence. "Back out to where we made each other." Darling felt the shudder of the words' effect run through rather, but from the strange new distance of separate bodies. He longed to be within her. Even in this embrace, she felt strangely distant. Darling still wasn't used to having his own skin, his own hands, a distinct and public voice. He missed the intimacy of shared flesh and senses. He definitely didn't like being in another room from rather for long, though sometimes he went to the darkness to contemplate things, into that black void that stretched to infinity when he turned his senses off. That was almost like being a starship again, a mote in the reaches of space. But even there Darling would miss rather. Perhaps he was a little like a dog. He leaned into her reassuring warmth and physicality, tendrils reaching to feel the tremors of limbs, the beating of her heart, the movements of her eyes.