

Blindsight

Peter Watts

For Lisa

If we're not in pain, we're not alive.

# **Prologue**

## **Theseus**

Rorschach

Charybdis

## Acknowledgments

## Notes and References



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“This is what fascinates me most in existence: the peculiar necessity of imagining what is, in fact, real.”

—Philip Gourevitch

“You will die like a dog for no good reason.”

—Ernest Hemingway

## Prologue

“Try to touch the past. Try to deal with the past. It’s not real. It’s just a dream.”

—Ted Bundy

It didn’t start out here. Not with the scramblers or *Rorschach*, not with Big Ben or *Theseus* or the vampires. Most people would say it started with the Fireflies, but they’d be wrong. It *ended* with all those things.

For me, it began with Robert Paglino.

At the age of eight, he was my best and only friend. We were fellow outcasts, bound by complementary misfortune. Mine was developmental. His was genetic: an uncontrolled genotype that left him predisposed to nearsightedness, acne, and (as it later turned out) a susceptibility to narcotics. His parents had never had him optimized. Those few TwenCen relics who still believed in God also held that one shouldn’t try to improve upon His handiwork. So although both of us *could* have been repaired, only one of us *had* been.

I arrived at the playground to find Pag the center of attention for some half-dozen kids, those lucky few in front punching him in the head, the others making do with taunts of *mongrel* and *polly* while waiting their turn. I watched him raise his arms, almost hesitantly, to ward off the worst of the blows. I could see into his head better than I could see into my own; he was scared that his attackers might think those hands were coming up to hit *back*, that they’d read it as an act of defiance and hurt him even more. Even then, at the tender age of eight and with half my mind gone, I was becoming a superlative observer.

But I didn’t know what to do.

I hadn’t seen much of Pag lately. I was pretty sure he’d been avoiding me. Still, when your best friend’s in trouble you help out, right? Even if the odds are impossible—and how many eight-year-olds would go up against six bigger kids for a sandbox buddy?—at least you call for backup. Flag a sentry. *Something*.

I just stood there. I didn’t even especially *want* to help him.

That didn't make sense. Even if he hadn't been my best friend, I should at least have empathized. I'd suffered less than Pag in the way of overt violence; my seizures tended to keep the other kids at a distance, scared *them* even as they incapacitated *me*. Still. I was no stranger to the taunts and insults, or the foot that appears from nowhere to trip you up en route from A to B. I knew how that felt.

Or I had, once.

But that part of me had been cut out along with the bad wiring. I was still working up the algorithms to get it back, still learning by observation. Pack animals always tear apart the weaklings in their midst. Every child knows that much instinctively. Maybe I should just let that process unfold, maybe I shouldn't try to mess with nature. Then again, Pag's parents hadn't messed with nature, and look what it got them: a son curled up in the dirt while a bunch of engineered superboys kicked in his ribs.

In the end, propaganda worked where empathy failed. Back then I didn't so much think as observe, didn't deduce so much as *remember*—and what I remembered was a thousand inspirational stories lauding anyone who ever stuck up for the underdog.

So I picked up a rock the size of my fist and hit two of Pag's assailants across the backs of their heads before anyone even knew I was in the game.

A third, turning to face the new threat, took a blow to the face that audibly crunched the bones of his cheek. I remember wondering why I didn't take any satisfaction from that sound, why it meant nothing beyond the fact I had one less opponent to worry about.

The rest of them ran at the sight of blood. One of the braver promised me I was dead, shouted "*Fucking zombie!*" over his shoulder as he disappeared around the corner.

Three decades it took, to see the irony in that remark.

Two of the enemy twitched at my feet. I kicked one in the head until it stopped moving, turned to the other. Something grabbed my arm and I swung without thinking, without *looking* until Pag yelped and ducked out of reach.

"Oh," I said. "Sorry."

One thing lay motionless. The other moaned and held its head and curled up in a ball.

“Oh\_ shit\_,” Pag panted. Blood coursed unheeded from his nose and splattered down his shirt. His cheek was turning blue and yellow. “Oh\_ shit *oh shit oh* shit...\_”

I thought of something to say. “You all right?”

“Oh *shit*, you—I mean, you *never*...” He wiped his mouth. Blood smeared the back of his hand. “Oh *man* are we in trouble.”

“They started it.”

“Yeah, but you—I mean, *look* at them!”

The moaning thing was crawling away on all fours. I wondered how long it would be before it found reinforcements. I wondered if I should kill it before then.

“You’da *never* done that before,” Pag said.

Before the operation, he meant.

I actually did feel something then—faint, distant, but unmistakable. I felt angry. “They *started*—”

Pag backed away, eyes wide. “What are you *doing*? Put that *down*!”

I’d raised my fists. I didn’t remember doing that. I unclenched them. It took a while. I had to look at my hands very hard for a long, long time.

The rock dropped to the ground, blood-slick and glistening.

“I was trying to help.” I didn’t understand why he couldn’t *see* that.

“You’re, you’re not the *same*,” Pag said from a safe distance. “You’re not even *Siri* any more.”

“I am too. Don’t be a fuckwad.”

“*They cut out your brain!*”

“Only half. For the ep—”

“I *know* for the epilepsy! You think I don’t know? But you were *in* that half—or, like, *part* of you was...” He struggled with the words, with the concept behind them. “And now you’re *different*. It’s like, your mom and dad *murdered* you—”

“My mom and dad,” I said, suddenly quiet, “saved my life. I would have *died*.”

“I think you *did* die,” said my best and only friend. “I think *Siri* died, they scooped him out and threw him away and you’re some whole other kid that just, just *grew back* out of what was left. You’re not the *same*. Ever since. You’re not the *same*.”

I still don’t know if Pag really knew what he was saying. Maybe his mother had just pulled the plug on whatever game he’d been wired into for the previous eighteen hours, forced him outside for some fresh air. Maybe, after fighting pod people in gamespace, he couldn’t help but see them everywhere. Maybe.

But you could make a case for what he said. I do remember Helen telling me (and *telling* me) how difficult it was to adjust. *Like you had a whole new personality*, she said, and why not? There’s a reason they call it *radical* hemispherectomy: half the brain thrown out with yesterday’s krill, the remaining half press-ganged into double duty. Think of all the rewiring that one lonely hemisphere must have struggled with as it tried to take up the slack. It turned out okay, obviously. The brain’s a very flexible piece of meat; it took some doing, but it adapted. *I* adapted. Still. Think of all that must have been squeezed out, deformed, *reshaped* by the time the renovations were through. You could argue that I’m a different person than the one who used to occupy this body.

The grownups showed up eventually, of course. Medicine was bestowed, ambulances called. Parents were outraged, diplomatic volleys exchanged, but it’s tough to drum up neighborhood outrage on behalf of your injured baby when playground surveillance from three angles shows the little darling—and five of his buddies—kicking in the ribs of a disabled boy. My mother, for her part, recycled the usual complaints about problem children and absentee fathers—Dad was off again in some other hemisphere—but the dust settled pretty quickly. Pag and I even stayed friends, after a short hiatus that reminded us both of the limited social prospects open to schoolyard rejects who don’t stick together.

So I survived that and a million other childhood experiences. I grew up and I got along. I learned to fit in. I observed, recorded, derived the algorithms and mimicked appropriate behaviors. Not much of it was—heartfelt, I guess the word is. I had friends and enemies, like everyone else. I chose them by running through checklists of behaviors and circumstances compiled from years of observation.

I may have grown up distant but I grew up *objective*, and I have Robert Paglino to thank for that. His seminal observation set everything in motion. It led me into Synthesis, fated me to our disastrous encounter with the Scramblers, spared me the worse fate befalling Earth. Or the better one, I suppose, depending on your point of view. Point of view *matters*: I see that now, blind, talking to myself, trapped in a coffin falling past the edge of the solar system. I see it for the first time since some beaten bloody friend on a childhood battlefield convinced me to throw my own point of view away.

He may have been wrong. *I* may have been. But that, that *distance*—that chronic sense of being an alien among your own kind—it's not entirely a bad thing.

It came in especially handy when the real aliens came calling.

Theseus

“Blood makes noise.” —Susanne Vega

Imagine you are Siri Keeton:

You wake in an agony of resurrection, gasping after a record-shattering bout of sleep apnea spanning one hundred forty days. You can feel your blood, syrupy with dobutamine and leuenkephalin, forcing its way through arteries shriveled by months on standby. The body *inflates* in painful increments: blood vessels dilate; flesh peels apart from flesh; ribs crack in your ears with sudden unaccustomed flexion. Your joints have seized up through disuse. You’re a stick-man, frozen in some perverse *rigor vitae*.

You’d scream if you had the breath.

Vampires did this all the time, you remember. It was *normal* for them, it was their own unique take on resource conservation. They could have taught your kind a few things about restraint, if that absurd aversion to right-angles hadn’t done them in at the dawn of civilization. Maybe they still can. They’re back now, after all— raised from the grave with the voodoo of paleogenetics, stitched together from junk genes and fossil marrow steeped in the blood of sociopaths and high-functioning autistics. One of them commands this very mission. A handful of his genes live on in your own body so it too can rise from the dead, here at the edge of interstellar space. Nobody gets past Jupiter without becoming part vampire.

The pain begins, just slightly, to recede. You fire up your inlays and access your own vitals: it’ll be long minutes before your body responds fully to motor commands, hours before it stops hurting. The pain’s an unavoidable side effect. That’s just what happens when you splice vampire subroutines into Human code. You asked about painkillers once, but nerve blocks of any kind *compromise metabolic reactivation*. Suck it up, soldier.

You wonder if this was how it felt for Chelsea, before the end. But that evokes a whole other kind of pain, so you block it out and concentrate on the life pushing its way back into your extremities. Suffering in silence, you check the logs for fresh telemetry.

You think: *That can't be right.*

Because if it is, you're in the wrong part of the universe. You're not in the Kuiper Belt where you belong: you're high above the ecliptic and deep into the Oort, the realm of long-period comets that only grace the sun every million years or so. You've gone *interstellar*, which means (you bring up the system clock) you've been undead for eighteen hundred days.

You've overslept by almost five years.

The lid of your coffin slides away. Your own cadaverous body reflects from the mirrored bulkhead opposite, a desiccated lungfish waiting for the rains. Bladders of isotonic saline cling to its limbs like engorged antiparasites, like the opposite of leeches. You remember the needles going in just before you shut down, way back when your veins were more than dry twisted filaments of beef jerky.

Szpindel's reflection stares back from his own pod to your immediate right. His face is as bloodless and skeletal as yours. His wide sunken eyes jiggle in their sockets as he reacquires his own links, sensory interfaces so massive that your own off-the-shelf inlays amount to shadow-puppetry in comparison.

You hear coughing and the rustling of limbs just past line-of-sight, catch glimpses of reflected motion where the others stir at the edge of vision.

"Wha—" Your voice is barely more than a hoarse whisper. "...happ...?"

Szpindel works his jaw. Bone cracks audibly.

"...Sssuckered," he hisses.

You haven't even met the aliens yet, and already they're running rings around you.

\*

So we dragged ourselves back from the dead: five part-time cadavers, naked, emaciated, barely able to move even in zero gee. We emerged from our coffins like premature moths ripped from their cocoons, still half-grub. We were alone and off course and utterly helpless, and it took a conscious effort to remember: they would never have risked our lives if we hadn't been essential.



“Morning, commissar.” Isaac Szpindel reached one trembling, insensate hand for the feedback gloves at the base of his pod. Just past him, Susan James was curled into a loose fetal ball, murmuring to herself. Only Amanda Bates, already dressed and cycling through a sequence of bone-cracking isometrics, possessed anything approaching mobility. Every now and then she tried bouncing a rubber ball off the bulkhead; but not even she was up to catching it on the rebound yet.

The journey had melted us down to a common archetype. James’ round cheeks and hips, Szpindel’s high forehead and lumpy, lanky chassis—even the enhanced carboplatinum brick shit-house that Bates used for a body— all had shriveled to the same desiccated collection of sticks and bones. Even our hair seemed to have become strangely discolored during the voyage, although I knew that was impossible. More likely it was just filtering the pallor of the skin beneath. Still. The pre-dead James had been dirty blond, Szpindel’s hair had been almost dark enough to call *black*— but the stuff floating from their scalps looked the same dull kelpy brown to me now. Bates kept her head shaved, but even her eyebrows weren’t as rusty as I remembered them.

We’d revert to our old selves soon enough. Just add water. For now, though, the old slur was freshly relevant: the Undead really did all look the same, if you didn’t know how to look.

If you did, of course—if you forgot appearance and watched for motion, ignored meat and studied *topology*—you’d never mistake one for another. Every facial tic was a data point, every conversational pause spoke volumes more than the words to either side. I could see James’ personae shatter and coalesce in the flutter of an eyelash. Szpindel’s unspoken distrust of Amanda Bates shouted from the corner of his smile. Every twitch of the phenotype cried aloud to anyone who knew the language.

“Where’s—” James croaked, coughed, waved one spindly arm at Sarasti’s empty coffin gaping at the end of the row.

Szpindel’s lips cracked in a small rictus. “Gone back to Fab, eh? Getting the ship to build some dirt to lie on.”

“Probably communing with the Captain.” Bates breathed louder than she spoke, a dry rustle from pipes still getting reacquainted with the idea of respiration.

James again: “Could do that up here.”

“Could take a dump up here, too,” Szpindel rasped. “Some things you do by yourself, eh?”

And some things you kept *to* yourself. Not many baselines felt comfortable locking stares with a vampire—Sarasti, ever courteous, tended to avoid eye contact for exactly that reason—but there were other surfaces to his topology, just as mammalian and just as readable. If he had withdrawn from public view, maybe I was the reason. Maybe he was keeping secrets.

After all, *Theseus* damn well was.

\*

She'd taken us a good fifteen AUs towards our destination before something scared her off course. Then she'd skidded north like a startled cat and started climbing: a wild high three-gee burn off the ecliptic, thirteen hundred tonnes of momentum bucking against Newton's First. She'd emptied her Penn tanks, bled dry her substrate mass, squandered a hundred forty days' of fuel in hours. Then a long cold coast through the abyss, years of stingy accounting, the thrust of every antiproton weighed against the drag of sieving it from the void. Teleportation isn't magic: the Icarus stream couldn't send us the actual antimatter it made, only the quantum specs. *Theseus* had to filterfeed the raw material from space, one ion at a time. For long dark years she'd made do on pure inertia, hoarding every swallowed atom. Then a flip; ionizing lasers strafing the space ahead; a ramscoop thrown wide in a hard brake. The weight of a trillion trillion protons slowed\_\_her down and refilled her gut and flattened us all over again. *Theseus* had burned relentless until almost the moment of our resurrection.

It was easy enough to retrace those steps; our course was there in ConSensus for anyone to see. Exactly why the ship had blazed that trail was another matter. Doubtless it would all come out during the post-rez briefing. We were hardly the first vessel to travel under the cloak of *sealed orders*, and if there'd been a pressing need to know by now we'd have known by now. Still, I wondered who had locked out the Comm logs. Mission Control, maybe. Or Sarasti. Or *Theseus* herself, for that matter. It was easy to forget the Quantical AI at the heart of our ship. It stayed so discreetly in the background, nurtured and carried us and permeated our existence like an unobtrusive God; but like God, it never took

your calls.

Sarasti was the official intermediary. When the ship did speak, it spoke to him—and Sarasti called it *Captain*.

So did we all.

\*

He'd given us four hours to come back. It took more than three just to get me out of the crypt. By then my brain was at least firing on most of its synapses, although my body—still sucking fluids like a thirsty sponge—continued to ache with every movement. I swapped out drained electrolyte bags for fresh ones and headed aft.

Fifteen minutes to spin-up. Fifty to the post-resurrection briefing. Just enough time for those who preferred gravity-bound sleep to haul their personal effects into the drum and stake out their allotted 4.4 square meters of floor space.

Gravity—or any centripetal facsimile thereof—did not appeal to me. I set up my own tent in zero-gee and as far to stern as possible, nuzzling the forward wall of the starboard shuttle tube. The tent inflated like an abscess on *Theseus*' spine, a little climate-controlled bubble of atmosphere in the dark cavernous vacuum beneath the ship's carapace. My own effects were minimal; it took all of thirty seconds to stick them to the wall, and another thirty to program the tent's environment.

Afterwards I went for a hike. After five years, I needed the exercise.

Stern was closest, so I started there: at the shielding that separated payload from propulsion. A single sealed hatch blistered the aft bulkhead dead center. Behind it, a service tunnel wormed back through machinery best left untouched by human hands. The fat superconducting torus of the ramscoop ring; the antennae fan behind it, unwound now into an indestructible soap-bubble big enough to shroud a city, its face turned sunward to catch the faint quantum sparkle of the Icarus antimatter stream. More shielding behind that; then the telematter reactor, where raw hydrogen and refined information conjured fire three hundred times hotter than the sun's. I knew the incantations, of course—antimatter cracking and deconstruction, the teleportation of quantum serial numbers—but it was still magic to me, how we'd come so far so fast. It would have been magic to anyone.

Except Sarasti, maybe.

Around me, the same magic worked at cooler temperatures and to less volatile ends: a small riot of chutes and dispensers crowded the bulkhead on all sides. A few of those openings would choke on my fist: one or two could swallow me whole. *Theseus'* fabrication plant could build everything from cutlery to cockpits. Give it a big enough matter stockpile and it could have even been built another *Theseus*, albeit in many small pieces and over a very long time. Some wondered if it could build another crew as well, although we'd all been assured that was impossible. Not even these machines had fine enough fingers to reconstruct a few trillion synapses in the space of a human skull. Not yet, anyway.

I believed it. They would never have shipped us out fully-assembled if there'd been a cheaper alternative.

I faced forward. Putting the back of my head against that sealed hatch I could see almost to *Theseus'* bow, an uninterrupted line-of-sight extending to a tiny dark bull's-eye thirty meters ahead. It was like staring at a great textured target in shades of white and gray: concentric circles, hatches centered within bulkheads one behind another, perfectly aligned. Every one stood open, in nonchalant defiance of a previous generation's safety codes. We could keep them closed if we wanted to, if it made us feel safer. That was all it would do, though; it wouldn't improve our empirical odds one whit. In the event of trouble those hatches would slam shut long milliseconds before Human senses could even make sense of an alarm. They weren't even computer-controlled. *Theseus'* body parts had *reflexes*.

I pushed off against the stern plating—wincing at the tug and stretch of disused tendons—and coasted forward, leaving Fab behind. The shuttle-access hatches to *Scylla* and *Charybdis* briefly constricted my passage to either side. Past them the spine widened into a corrugated extensible cylinder two meters across and—at the moment—maybe fifteen long. A pair of ladders ran opposite each other along its length; raised portholes the size of manhole covers stippled the bulkhead to either side. Most of those just looked into the hold. A couple served as general-purpose airlocks, should anyone want to take a stroll beneath the carapace. One opened into my tent. Another, four meters further forward, opened into Bates'.

From a third, just short of the forward bulkhead, Jukka Sarasti climbed into view like a long white spider.

If he'd been Human I'd have known instantly what I saw there, I'd have smelled *murderer* all over his topology. And I wouldn't have been able to even guess at the number of his victims, because his affect was so utterly without remorse. The killing of a hundred would leave no more stain on Sarasti's surfaces than the swatting of an insect; guilt beaded and rolled off this creature like water on wax.

But Sarasti wasn't human. Sarasti was a whole different animal, and coming from him all those homicidal refractions meant nothing more than *predator*. He had the inclination, was born to it; whether he had ever acted on it was between him and Mission Control.

*Maybe they cut you some slack, I didn't say to him. Maybe it's just a cost of doing business. You're mission-critical, after all. For all I know you cut a deal. You're so very smart, you know we wouldn't have brought you back in the first place if we hadn't needed\_ you. From the day they cracked the vat you knew you had leverage.\_*

*Is that how it works, Jukka? You save the world, and the folks who hold your leash agree to look the other way?*

As a child I'd read tales about jungle predators transfixing their prey with a stare. Only after I'd met Jukka Sarasti did I know how it felt. But he wasn't looking at me now. He was focused on installing his own tent, and even if he *had* looked me in the eye there'd have been nothing to see but the dark wraparound visor he wore in deference to Human skittishness. He ignored me as I grabbed a nearby rung and squeezed past.

I could have sworn I smelled raw meat on his breath.

Into the drum (*\_drums\_*, technically; the BioMed hoop at the back spun on its own bearings). I flew through the center of a cylinder sixteen meters across. *Theseus'* spinal nerves ran along its axis, the exposed plexii and piping bundled against the ladders on either side. Past them, Szpindel's and James' freshly-erected tents rose from nooks on opposite sides of the world. Szpindel himself floated off my shoulder, still naked but for his gloves, and I could tell from the way his fingers moved that his favorite color was green. He anchored himself to one of three stairways to nowhere arrayed around the drum: steep narrow steps

rising five vertical meters from the deck into empty air.

The next hatch gaped dead-center of the drum's forward wall; pipes and conduits plunged into the bulkhead to each side. I grabbed a convenient rung to slow myself—biting down once more on the pain—and floated through.

T-junction. The spinal corridor continued forward, a smaller diverticulum branched off to an EVA cubby and the forward airlock. I stayed the course and found myself back in the crypt, mirror-bright and less than two meters deep. Empty pods gaped to the left; sealed ones huddled to the right. We were so irreplaceable we'd come with replacements. They slept on, oblivious. I'd met three of them back in training. Hopefully none of us would be getting reacquainted any time soon.

Only four pods to starboard, though. No backup for Sarasti.

Another hatchway. Smaller this time. I squeezed through into the bridge. Dim light there, a silent shifting mosaic of icons and alphanumeric iterating across dark glassy surfaces. Not so much bridge as cockpit, and a cramped one at that. I'd emerged between two acceleration couches, each surrounded by a horseshoe array of controls and readouts. Nobody expected to ever *use* this compartment. *Theseus* was perfectly capable of running herself, and if she wasn't we were capable of running her from our inlays, and if we weren't the odds were overwhelming that we were all dead anyway. Still, against that astronomically off-the-wall chance, this was where one or two intrepid survivors could pilot the ship home again after everything else had failed.

Between the footwells the engineers had crammed one last hatch and one last passageway: to the observation blister on *Theseus'* prow. I hunched my shoulders (tendons cracked and complained) and pushed through—

—into darkness. Clamshell shielding covered the outside of the dome like a pair of eyelids squeezed tight. A single icon glowed softly from a touchpad to my left; faint stray light followed me through from the spine, brushed dim fingers across the concave enclosure. The dome resolved in faint shades of blue and gray as my eyes adjusted. A stale draft stirred the webbing floating from the rear bulkhead, mixed oil and machinery at the back of my throat. Buckles clicked faintly in the breeze like impoverished wind chimes.

I reached out and touched the crystal: the innermost layer of two, warm air piped

through the gap between to cut the cold. Not completely, though. My fingertips chilled instantly.

Space out there.

Perhaps, en route to our original destination, *Theseus* had seen something that scared her clear out of the solar system. More likely she hadn't been running away from anything but *to* something else, something that hadn't been discovered until we'd already died and gone from Heaven. In which case...

I reached back and tapped the touchpad. I half-expected nothing to happen; *Theseus*' windows could be as easily locked as her comm logs. But the dome split instantly before me, a crack then a crescent then a wide-eyed lidless stare as the shielding slid smoothly back into the hull. My fingers clenched reflexively into a fistful of webbing. The sudden void stretched empty and unforgiving in all directions, and there was nothing to cling to but a metal disk barely four meters across.

Stars, everywhere. So many stars that I could not for the life me understand how the sky could contain them all yet be so black. Stars, and—

—nothing else.

*What did you expect?* I chided myself. *An alien mothership hanging off the starboard bow?*

Well, why not? We were out here for *something*.

The others were, anyway. They'd be essential no matter where we'd ended up. But my own situation was a bit different, I realized. *My* usefulness degraded with distance.

And we were over half a light year from home.

“When it is dark enough, you can see the stars.”

—Emerson

Where was I when the lights came down?

I was emerging from the gates of Heaven, mourning a father who was—to his own mind, at least—still alive.

It had been scarcely two months since Helen had disappeared under the cowl. Two months by our reckoning, at least. From her perspective it could have been a day or a decade; the Virtually Omnipotent set their subjective clocks along with everything else.

She wasn't coming back. She would only deign to see her husband under conditions that amounted to a slap in the face. He didn't complain. He visited as often as she would allow: twice a week, then once. Then every two. Their marriage decayed with the exponential determinism of a radioactive isotope and still he sought her out, and accepted her conditions.

On the day the lights came down, I had joined him at my mother's side. It was a special occasion, the last time we would ever see her in the flesh. For two months her body had lain in state along with five hundred other new ascendants on the ward, open for viewing by the next of kin. The interface was no more real than it would ever be, of course; the body could not talk to us. But at least it was *there*, its flesh warm, the sheets clean and straight. Helen's lower face was still visible below the cowl, though eyes and ears were helmeted. We could touch her. My father often did. Perhaps some distant part of her still felt it.

But eventually someone has to close the casket and dispose of the remains. Room must be made for the new arrivals—and so we came to this last day at my mother's side. Jim took her hand one more time. She would still be available in her world, on her terms, but later this day the body would be packed into storage facilities crowded far too efficiently for flesh and blood visitors. We had been assured that the body would remain intact—the muscles electrically exercised, the body flexed and fed, the corpus kept ready to return to active duty should Heaven experience some inconceivable and catastrophic meltdown. Everything was reversible, we were told. And yet—there were so many who had ascended, and not even the deepest catacombs go on forever. There were rumors of dismemberment, of nonessential body parts hewn away over time according to some optimum-packing algorithm. Perhaps Helen would be a torso this time next year, a disembodied head the year after. Perhaps her chassis would be stripped down to the brain before we'd even left the building, awaiting only that final technological breakthrough that would herald the arrival of the Great Digital Upload.



Rumors, as I say. I personally didn't know of anyone who'd come back after ascending, but then why would anyone want to? Not even Lucifer left Heaven until he was pushed.

Dad might have known for sure—Dad knew more than most people, about the things most people weren't supposed to know—but he never told tales out of turn. Whatever he knew, he'd obviously decided its disclosure wouldn't have changed Helen's mind. That would have been enough for him.

We donned the hoods that served as day passes for the Unwired, and we met my mother in the spartan visiting room she imagined for these visits. She'd built no windows into the world she occupied, no hint of whatever utopian environment she'd constructed for herself. She hadn't even opted for one of the prefab visiting environments designed to minimize dissonance among visitors. We found ourselves in a featureless beige sphere five meters across. There was nothing in there but her.

*Maybe not so far removed from her vision of utopia after all, I thought.*

My father smiled. "Helen."

"Jim." She was twenty years younger than the thing on the bed, and still she made my skin crawl. "Siri! You came!"

She always used my name. I don't think she ever called me *son*.

"You're still happy here?" my father asked.

"Wonderful. I do wish you could join us."

Jim smiled. "Someone has to keep the lights on."

"Now you *know* this isn't goodbye," she said. "You can visit whenever you like."

"Only if you do something about the scenery." Not just a joke, but a lie; Jim would have come at her call even if the gauntlet involved bare feet and broken glass.

"And Chelsea, too," Helen continued. "It would be so nice to finally meet her

after all this time.”

“Chelsea’s *gone*, Helen,” I said.

“Oh yes but I know you stay in touch. I know she was special to you. Just because you’re not *together* any more doesn’t mean she can’t—”

“*You know she—*”

A startling possibility stopped me in midsentence: maybe I hadn’t actually told them.

“Son,” Jim said quietly. “Maybe you could give us a moment.”

I would have given them a fucking lifetime. I unplugged myself back to the ward, looked from the corpse on the bed to my blind and catatonic father in his couch, murmuring sweet nothings into the datastream. Let them perform for each other. Let them formalize and finalize their so-called relationship in whatever way they saw fit. Maybe, just once, they could even bring themselves to be honest, there in that other world where everything else was a lie. Maybe.

I felt no desire to bear witness either way.

But of course I had to go back in for my own formalities. I adopted my role in the familial set-piece one last time, partook of the usual lies. We all agreed that this wasn’t going to change anything, and nobody deviated enough from the script to call anyone else a liar on that account. And finally—careful to say *until next time* rather than *goodbye*—we took our leave of my mother.

I even suppressed my gag reflex long enough to give her a hug.

\*

Jim had his inhaler in hand as we emerged from the darkness. I hoped, without much hope, that he’d throw it into the garbage receptacle as we passed through the lobby. But he raised it to his mouth and took another hit of vassopressin, that he would never be tempted.

Fidelity in an aerosol. “You don’t need that any more,” I said.

“Probably not,” he agreed.

“It won’t work anyway. You can’t imprint on someone who isn’t even there, no matter how many hormones you snort. It just—”

Jim said nothing. We passed beneath the muzzles of sentries panning for infiltrating Realists.

“She’s *gone*,” I blurted. “She doesn’t care if you find someone else. She’d be happy if you did.” *It would let her pretend the books had been balanced.*

“She’s my wife,” he told me.

“That doesn’t mean what it used to. It never did.”

He smiled a bit at that. “It’s my life, son. I’m comfortable with it.”

“Dad—”

“I don’t blame her,” he said. “And neither should you.”

Easy for him to say. Easy even to accept the hurt she’d inflicted on him all these years. This cheerful façade here at the end hardly made up for the endless bitter complaints my father had endured throughout living memory. *Do you think it’s easy when you disappear for months on end? Do you think it’s easy always wondering who you’re with and what you’re doing and if you’re even alive? Do you think it’s easy raising a child like that\_ on your own?\_*

She’d blamed him for everything, but he bore it gracefully because he knew it was all a lie. He knew he was only the pretense. She wasn’t leaving because he was AWOL, or unfaithful. Her departure had nothing to do with him at all. It was me. Helen had left the world because she couldn’t stand to look at the thing who’d replaced her son.

I would have pursued it—would have tried yet again to make my father *see*—but by now we’d left the gates of Heaven for the streets of Purgatory, where pedestrians on all sides murmured in astonishment and stared open-mouthed at the sky. I followed their gaze to a strip of raw twilight between the towers, and gasped—

The stars were falling.

The Zodiac had rearranged itself into a precise grid of bright points with luminous tails. It was as though the whole planet had been caught in some great closing net, the knots of its mesh aglow with St. Elmo's fire. It was beautiful. It was terrifying.

I looked away to recalibrate my distance vision, to give this ill-behaved hallucination a chance to vanish gracefully before I set my empirical gaze to high-beam. I saw a vampire in that moment, a female, walking among us like the archetypal wolf in sheep's clothing. Vampires were uncommon creatures at street level. I'd never seen one in the flesh before.

She had just stepped onto the street from the building across the way. She stood a head taller than the rest of us, her eyes shining yellow and bright as a cat's in the deepening dark. She realized, as I watched, that something was amiss. She looked around, glanced at the sky—and continued on her way, totally indifferent to the cattle on all sides, to the heavenly portent that had transfixed them. Totally indifferent to the fact that the world had just turned inside-out.

It was 1035 Greenwich Mean Time, February 13, 2082.

\*

They clenched around the world like a fist, each black as the inside of an event horizon until those last bright moments when they all burned together. They screamed as they died. Every radio up to geostat groaned in unison, every infrared telescope went briefly snowblind. Ashes stained the sky for weeks afterwards; mesospheric clouds, high above the jet stream, turned to glowing rust with every sunrise. The objects, apparently, consisted largely of iron. Nobody ever knew what to make of that.

For perhaps the first time in history, the world *knew* before being *told*: if you'd seen the sky, you had the scoop. The usual arbiters of newsworthiness, stripped of their accustomed role in filtering reality, had to be content with merely labeling it. It took them ninety minutes to agree on *Fireflies*. A half hour after that, the first Fourier transforms appeared in the noosphere; to no one's great surprise, the Fireflies had not wasted their dying breaths on static. There was pattern embedded in that terminal chorus, some cryptic intelligence that resisted all earthly analysis. The experts, rigorously empirical, refused to speculate: they

only admitted that the Fireflies had said *something*. They didn't know what.

Everyone else did. How else would you explain 65,536 probes evenly dispersed along a lat-long grid that barely left any square meter of planetary surface unexposed? Obviously the Flies had taken our picture. The whole world had been caught with its pants down in panoramic composite freeze-frame. We'd been *surveyed*—whether as a prelude to formal introductions or outright invasion was anyone's guess.

My father might have known someone who might have known. But by then he'd long since disappeared, as he always did during times of hemispheric crisis. Whatever he knew or didn't, he left me to find my own answers with everyone else.

There was no shortage of perspectives. The noosphere seethed with scenarios ranging from utopian to apocalyptic. The Fireflies had seeded lethal germs through the jet stream. The Fireflies had been on a nature safari. The Icarus Array was being retooled to power a doomsday weapon against the aliens. The Icarus Array had already been destroyed. We had decades to react; anything from another solar system would have to obey the lightspeed limit like everyone else. We had days to live; organic warships had just crossed the asteroid belt and would be fumigating the planet within a week.

Like everyone else, I bore witness to lurid speculations and talking heads. I visited blathernodes, soaked myself in other people's opinions. That was nothing new, as far as it went; I'd spent my whole life as a sort of alien ethologist in my own right, watching the world behave, gleaning patterns and protocols, learning the rules that allowed me to infiltrate human society. It had always worked before. Somehow, though, the presence of *real* aliens had changed the dynamics of the equation. Mere observation didn't satisfy any more. It was as though the presence of this new outgroup had forced me back into the clade whether I liked it or not; the distance between myself and the world suddenly seemed forced and faintly ridiculous.

Yet I couldn't, for my life, figure out how to let it go.

Chelsea had always said that telepresence emptied the Humanity from Human interaction. "They say it's indistinguishable," she told me once, "just like having your family right there, snuggled up so you can see them and feel them and

smell them next to you. But it's not. It's just shadows on the cave wall. I mean, sure, the shadows come in three-dee color with force-feedback tactile interactivity. They're good enough to fool the civilized brain. But your gut knows those aren't *people*, even if it can't put its finger on *how* it knows. They just don't *feel* real. Know what I mean?"

I didn't. Back then I'd had no clue what she was talking about. But now we were all cavemen again, huddling beneath some overhang while lightning split the heavens and vast formless monsters, barely glimpsed in bright strobe-frozen instants, roared and clashed in the darkness on all sides. There was no comfort in solitude. You couldn't get it from interactive shadows. You needed someone *real* at your side, someone to hold on to, someone to share your airspace along with your fear and hope and uncertainty.

I imagined the presence of companions who wouldn't vanish the moment I unplugged. But Chelsea was gone, and Pag in her wake. The few others I could have called—peers and former clients with whom my impersonations of rapport had been especially convincing—didn't seem worth the effort. Flesh and blood had its own relationship to reality: necessary, but not sufficient.

Watching the world from a distance, it occurred to me at last: I knew exactly what Chelsea had meant, with her Luddite ramblings about desaturated Humanity and the colorless interactions of virtual space. I'd known all along.

I'd just never been able to see how it was any different from real life.

\*

Imagine you are a machine.

Yes, I know. But imagine you're a different *kind* of machine, one built from metal and plastic and designed not by blind, haphazard natural selection but by engineers and astrophysicists with their eyes fixed firmly on specific goals. Imagine that your purpose is not to replicate, or even to survive, but to gather information.

I can imagine that easily. It is in fact a much simpler impersonation than the kind I'm usually called on to perform.

I coast through the abyss on the colder side of Neptune's orbit. Most of the time

I exist only as an absence, to any observer on the visible spectrum: a moving, asymmetrical silhouette blocking the stars. But occasionally, during my slow endless spin, I glint with dim hints of reflected starlight. If you catch me in those moments you might infer something of my true nature: a segmented creature with foil skin, bristling with joints and dishes and spindly antennae. Here and there a whisper of accumulated frost clings to a joint or seam, some frozen wisp of gas encountered in Jupiter space perhaps. Elsewhere I carry the microscopic corpses of Earthly bacteria who thrived with carefree abandon on the skins of space stations or the benign lunar surface—but who had gone to crystal at only half my present distance from the sun. Now, a breath away from Absolute Zero, they might shatter at a photon's touch.

My heart is warm, at least. A tiny nuclear fire burns in my thorax, leaves me indifferent to the cold outside. It won't go out for a thousand years, barring some catastrophic accident; for a thousand years, I will listen for faint voices from Mission Control and do everything they tell me to. So far they have told me to study comets. Every instruction I have ever received has been a precise and unambiguous elaboration on that one overriding reason for my existence.

Which is why these latest instructions are so puzzling, for they make no sense at all. The frequency is wrong. The signal strength is wrong. I cannot even understand the handshaking protocols. I request clarification.

The response arrives almost a thousand minutes later, and it is an unprecedented mix of orders and requests for information. I answer as best I can: yes, this is the bearing at which signal strength was greatest. No, it is not the usual bearing for Mission Control. Yes, I can retransmit: here it is, all over again. Yes, I will go into standby mode.

I await further instructions. They arrive 839 minutes later, and they tell me to stop studying comets immediately.

I am to commence a controlled precessive tumble that sweeps my antennae through consecutive 5-arc increments along all three axes, with a period of 94 seconds. Upon encountering any transmission resembling the one which confused me, I am to fix upon the bearing of maximal signal strength and derive a series of parameter values. I am also instructed to retransmit the signal to Mission Control.

I do as I'm told. For a long time I hear nothing, but I am infinitely patient and incapable of boredom. Eventually a fleeting, familiar signal brushes against my afferent array. I reacquire and track it to source, which I am well-equipped to describe: a trans-Neptunian comet in the Kuiper Belt, approximately two hundred kilometers in diameter. It is sweeping a 21-cm tightbeam radio wave across the heavens with a periodicity of 4.57 seconds. This beam does not intersect Mission Control's coordinates at any point. It appears to be directed at a different target entirely.

It takes much longer than usual for Mission Control to respond to this information. When it does, it tells me to change course. Mission Control informs me that henceforth my new destination is to be referred to as *Burns-Caulfield*. Given current fuel and inertial constraints I will not reach it in less than thirty-nine years.

I am to watch nothing else in the meantime.

\*

I'd been liaising for a team at the Kurzweil Institute, a fractured group of cutting-edge savants convinced they were on the verge of solving the quantum-glial paradox. That particular log-jam had stalled AI for decades; once broken, the experts promised we'd be eighteen months away from the first personality upload and only two years from reliable Human-consciousness emulation in a software environment. It would spell the end of corporeal history, usher in a Singularity that had been waiting impatiently in the wings for nigh on fifty years.

Two months after Firefall, the Institute cancelled my contract.

I was actually surprised it had taken them so long. It had cost us so much, this overnight inversion of global priorities, these breakneck measures making up for lost initiative. Not even our shiny new post-scarcity economy could withstand such a seismic shift without lurching towards bankruptcy. Installations in deep space, long since imagined secure by virtue of their remoteness, were suddenly vulnerable for exactly the same reason. Lagrange habitats had to be refitted for defense against an unknown enemy. Commercial ships on the Martian Loop were conscripted, weaponised, and reassigned; some secured the high ground over Mars while others fell sunward to guard the Icarus Array.

It didn't matter that the Fireflies hadn't fired a shot at any of these targets. We



simply couldn't afford the risk.

We were all in it together, of course, desperate to regain some hypothetical upper hand by any means necessary. Kings and corporations scribbled IOUs on the backs of napkins and promised to sort everything out once the heat was off. In the meantime, the prospect of Utopia in two years took a back seat to the shadow of Armageddon reaching back from next Tuesday. The Kurzweil Institute, like everyone else, suddenly had other things to worry about.

So I returned to my apartment, split a bulb of Glenfiddich, and arrayed virtual windows like daisy petals in my head. Everyone Icons debated on all sides, serving up leftovers two weeks past their expiry date:

*Disgraceful breakdown of global security.*

No harm done.

*Comsats annihilated. Thousands dead.*

*Random collisions. Accidental deaths.*

(who sent them?)

*We should have seen them coming. Why didn't we—*

Deep space. Inverse square. Do the math.

*They were stealthed\_!\_*

(what do they *want*?)

*We were raped!*

Jesus Christ. They just took our *picture*.

*Why the silence?*

Moon's fine. Mars's fine.

(Where are they?)

*Why haven't they made contact?*

Nothing's touched the O'Neills.

*Technology Implies Belligerence!*

(Are they coming back?)

Nothing attacked us.

*Yet*

Nothing *invaded*.

*So far.*

(But where *are* they?)

(Are they coming *back*?)

(Anyone?)

Jim Moore Voice Only

encrypted

Accept?

The text window blossomed directly in my line of sight, eclipsing the debate. I read it twice. I tried to remember the last time he'd called from the field, and couldn't.

I muted the other windows. "Dad?"

"Son," he replied after a moment. "Are you well?"

"Like everyone else. Still wondering whether we should be celebrating or crapping our pants."

He didn't answer immediately. "It's a big question, all right," he said at last.

"I don't suppose you could give me any advice? They're not telling us anything at ground level."

It was a rhetorical request. His silence was hardly necessary to make the point. "I know," I added after a moment. "Sorry. It's just, they're saying the Icarus Array went down, and—"

"You know I can't—oh." My father paused. "That's ridiculous. Icarus's fine."

"It is?"

He seemed to be weighing his words. "The Fireflies probably didn't even notice it. There's no particle trail as long as it stays offstream, and it would be buried in solar glare unless someone knew where to search."

It was my turn to fall silent. This conversation felt suddenly *wrong*.

Because when my father went on the job, he went dark. He *never* called his family.

Because even when my father came *off* the job, he never talked about it. It wouldn't matter whether the Icarus Array was still online or whether it had been shredded and thrown into the sun like a thousand kilometers of torn origami; he

wouldn't tell either tale unless an official announcement had been made. Which—I refreshed an index window just to be sure—it hadn't.

Because while my father was a man of few words, he was *not* a man of frequent, indecisive pauses—and he had hesitated before each and every line he'd spoken in this exchange.

I tugged ever-so-gently on the line—"But they've sent ships."—and started counting.

*One one-thousand, two one-thousand—*

"Just a precaution. Icarus was overdue for a visit anyway. You don't swap out your whole grid without at least dropping in and kicking the new tires first."

Nearly three seconds to respond.

"You're on the moon," I said.

Pause. "Close enough."

"What are you—Dad, why are you telling me this? Isn't this a security breach?"

"You're going to get a call," he told me.

"From who? Why?"

"They're assembling a team. The kind of—people you deal with." My father was too rational to dispute the contributions of the recons and hybrids in our midst, but he'd never been able to hide his mistrust of them.

"They need a synthesist," he said.

"Isn't it lucky you've got one in the family?"

Radio bounced back and forth. "This isn't nepotism, Siri. I wanted very much for them to pick someone else."

"Thanks for the vote of conf—"

But he'd seen it coming, and preempted me before my words could cross the

distance: “It’s not a slap at your abilities and you know it. You’re simply the most qualified, and the work is vital.”

“So why—” I began, and stopped. He wouldn’t want to keep me away from some theoretical gig in a WestHem lab.

“What’s this about, Dad?”

“The Fireflies. They found something.”

“*What?*”

“A radio signal. From the Kuiper. We traced the bearing.”

“They’re *talking?*”

“Not to us.” He cleared his throat. “It was something of a fluke that we even intercepted the transmission.”

“Who are they talking to?”

“We don’t know.”

“Friendly? Hostile?”

“Son, we don’t *know*. The encryption seems similar, but we can’t even be sure of that. All we have is the location.”

“So you’re sending a team.” *You’re sending me*. We’d never gone to the Kuiper before. It had been decades since we’d even sent robots. Not that we lacked the capacity. We just hadn’t bothered; everything we needed was so much closer to home. The Interplanetary Age had stagnated at the asteroids.

But now something lurked at the furthest edge of our backyard, calling into the void. Maybe it was talking to some other solar system. Maybe it was talking to something closer, something *en route*.

“It’s not the kind of situation we can safely ignore,” my father said.

“What about probes?”