

4: Will you still love me ...

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The radiation storm passes, watched only by impassive sensors mounted on the hub of the colony cylinder.

The eye of the storm is a small black hole: a spark of evil light in the abyss. It burns with a cold heat, blasting a sleet of hard gamma radiation out into the darkness of space. The hole itself is smaller than a protein molecule, a tiny knot of tortured spacetime that weighs as much as a mountain range. A halo of decaying matter swirls around it, dragged ever inwards by a force of gravity turned in on itself. As it closes in on the sump at the bottom of the gravity well the accretion disk heats up, until atoms split in the incandescent glare of an on-going explosion. A hot spray of high-energy radiation floods off it, hosing across the plane of the gas giant's system of moons. The hole is being used as a synchrotron source, an energy weapon bright enough to shine across interplanetary distances. A dark shape hides behind it, indistinct but almost as large as the colony: the physical body of the Ultrabright attack drone. The drone is a dumb killing machine, unmotivated -- as yet -- by the cool and unsympathetic mind of its maker. Given time, this will change ...

Its path takes it a long way from icy Turing or airless Pascal, but that makes no difference to their fate. A steady stream of exotic particles sprays out, bracketing Pascal and the L5 colony quite neatly. It's hotter than a solar flare, hotter than a nova: the radiation temperature is astronomical, hot enough to boil lead.

Closest approach is ten million kilometres. Drifting at under two percent of light-speed, the hole falls onward through the stellar system. In sixteen hours time it will reach the orbit of Wirth, the terraforming candidate that circles close in around Ridgegap-47.

The neutral particle beam that bathes the hole in exotic matter shuts off abruptly. Unseen moderators clamp down, damping the postron/electron reactions in the accretion disk. The hole continues to digest its halo of matter for a few scant minutes, but the dinner is over. Now it will starve until it reaches Wirth and the terraforming station Anubis abandoned years before. It is already a small hole, dangerously close to the lower bounds of stability. Small holes are hot, decaying by emitting Hawking radiation; this one is already toasting in the millions of degrees. When it explodes, the flash will be visible light years away.

That event is due in just over sixteen days time, some kilometres beneath the crust of the doomed planet ...

Oshi only really grasped the immensity of what had happened on the third day after the storm.

Awakening had been hard. She'd struggled up from the depths of a nightmarish dream in which she recapitulated the events of her early adulthood: condemned to relive the horrific awakening on Miramor Dubrovnic, then to undergo the hardening of the cynical shell that had protected her until the fateful mission on New Salazar. It was like sleep-walking through hard-setting clay, or struggling for breath beneath the cool suffocation of an avalanche. Remembering when she'd had Ivan was the least of it: his loss was somewhat faded now, a sepia photographic memory with edges too blunted to cut deep. (Her childhood, by contrast, remained the only thing that could easily break through the armour she wore.)

But on the third morning she had opened her eyes gasping, her arms outstretched before her in the idiot zombie-posture of free fall relaxation. "Where is --" she began.

Axial redoubt command bunker. Status report available.

"That's --" she stopped and blinked, the thick encrustation of sleep heavy on her eyelashes. She could feel the uncomfortable intrusions of her exoskeleton, tubes probing deep within to irrigate and clean and feed her body. " *How long have I been asleep?*"

Two days.

Two days. She felt as if it had been two hours. "What's happened?"

Radiation levels decreased to normal. External life support remains down. External colony support is on criticality rung seven of eight. Prognosis: this station will cease to be habitable in the near future.

"Oh."

It was all she could think of to say. She glanced round, taking in the survival gear lockers, the airlock leading up and out towards the manufacturing and docking complexes of the hub: the huge monitor that covered the end-wall of the command bunker. "External sensors," she mumbled. "Give me what rim coverage you can manage: I want to take a look."

Affirmative. Viewport on main screen ...

Over the next hour, Oshi learned that she was alone. The radiation had killed off most of the higher life forms in the colony. Insects survived, thriving on the corpses, but nothing else above the level of a mouse had survived for long, except the tapeworm.

The biological weapon was unstoppable. After taking root, it had erupted from the corpse to wage systematic warfare on the entire colony. It ran wild through the residential sectors, hyphae digesting the putrefying bodies that dotted the complex. Although it had started as a mere parasite flatworm, it was now the most elaborate predator in the colony. It cannibalised the genetic heritage of its victims, absorbing the data via an elaborate nanoscale assimilation engine; a post-Lamarckian organism, it evolved by integrating and expressing characteristics usually associated with other species. Fat cords and furry ropes of fungus lay, corpulent and glistening, in pools of purulent fluid that contained anything it couldn't digest. It randomly interpreted the DNA of dead people and animals, sprouting random experiments derived from homoeobox control sequences. Strange phalloid structures towered over the bulbous buildings, the bones of humans and deer and Goon Squad meat machines scattered around their omnivorous trunks. An arm coated in fur waved feebly from a bush of throbbing viscera near the medicentre. A cylindrical, dark-skinned mushroom, its cap a wrinkled topology looted from some other species, overlooked the wreckage of the Administrator's office with an expression of murine horror on its flattened rodent face. Dying landpussies -- aerobic octopi, customised for low-gee harvesting -- hung like purulent fruit from the mycotic trees, their skins strobing through silvery-green panic hues as they died. Strange, rodent bushes whirred and chattered among the branches, chained to their parent organism by long umbilical cords that resembled everted intestines.

Oshi had no desire to share her biosphere with such a runaway horror. She had more than a suspicion that if it caught her it would treat her as just another parcel of protein: in any case, there was much that demanded attention in the core. The airlock doors stayed resolutely shut, the axial redoubt running on canned air. There would be time to explore later.

Oshi spent the next two days exploring her twilight domain, checking over resources and making a comprehensive inventory. She didn't stop to think: somehow she knew that if she stopped she might never start again. She worked with the feverish single-mindedness of a crash survivor stranded in a desert far from civilization. She paused only to swallow some meagre rations, or to close her eyes for an hour of exhausted sleep. The colony central planning methodologies were intact, she discovered, dumped to static store before the radiation attack. The robot factories, extending from the long axis of the colony like a string of garlic bulbs attached to a medicine ball, could be powered up and reconfigured to produce anything she desired. Resources were limited -- only a few megatons of raw materials were on hand -- but Oshi could hardly see how that mattered. Three things could

happen in the near future. The ultrabright presence (she shuddered at this thought, which rose to meet her in eerie dreams) might come to the colony; the colony itself might disintegrate before the depradations of the ontological weapon chewing away at its guts: or her own survival plan might succeed. Not that she held much hope for it, but it seemed to her that the third option was little better than the other two. After all, she was twenty light-years from the nearest other civilized world. And when she got there, if she got there, the Boss would be sure to notice ...

When these worries assailed her she shook her head impatiently, laughed -- somewhat dementedly -- and felt a transient sorrow. *If only I'd kept my mouth shut in front of the Boss none of this would have happened*, she rationalised. If only the superbrights hadn't trusted the entire system to one dangerously unstable AI, she would not have been needed here. If only the escapists hadn't deployed that incredibly stupid biological weapon, or if only they'd managed to follow her up to the redoubt ... this entire fiasco might have been avoided by any number of gamits. Oshi felt a vast and tenuous sense of guilt, aggravated by a sense of failure. It did not strike her as inappropriate. After all, in a very real way she *had* failed.

The event that finally broke through her frail shell of obsession occurred on the fifth day. That morning, Oshi awakened in the core control room with a sense of purpose. The night before she had planned her day in advance; she was going to enter the factory zones, locate certain items of equipment that were being assembled to her specification, and move them to the docking bay. The items were specialised and deadly; lengths of monofilament cable, refurbished attitude-thrusters, life support components for one of the docked shuttlecraft.

Almost without thinking she found herself in the factory unit. It was a geodesic sphere lined with robots that hurled components from one side to the other, guided by sonar and timing interrupts. There was something organic about the process, like cilia lining the wall of the gut of some primitive organism. Oshi waited impatiently, having arrived too early.

She floated in the main cargo entrance, keeping well out of the way; she had no desire to be pulped between a flying thruster-chassis and a blind drone. It was there that she saw something floating in the twilit centre of the room, not moving despite the barrage of components drifting past on all sides. She frowned.

The object was asymmetric, lumpy, almost unrecognisable as it slid out of shadow, into a harsh cone of light cast by a welding torch that illuminated its features mercilessly. Its rag-doll face was withered and sunken; limbs flopped randomly where slowly-contracting tendons had pulled them in gravity-free rigor.

Yes, she thought. *Even here. Is there no end to it?* A wave of depression swept over her.

Yes, that's right. Run away from it. Run away from reality! What else is there to do? Oshi turned away, unable to express her sense of disconnected despair verbally -- she had a morbid fear that if she started talking to herself she would slip slowly into a breakdown. There seemed to be nothing around her but death on all sides; past, present, future. Turning her face away from the accusing corpse, she made the connection; and she made another one, via wisdom uplink, to the core communications buffer.

"Tell me your status," she sent. "List uploads in progress."

```
Status: functional following self-repair self-test
sequence. Pascal gatecoder responding but isolated.
Diagnostics indicate that a terminal Dreamtime fault
occured four days ago. No other gatecoders on line. All
uploads queued pending fault resolution. Total two thousand
three hundred and nineteen uploads in progress. Loading
nominal.
```

Oshi's eyes widened. "You're holding more than two thousand uploads! What happened on Pascal?"

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The literal-minded comm supervisor paused for a moment before answering. Query in
progress. Please wait. Please wait. Please wait --
confirmed. At T minus three hundred and sixty thousand
seconds Pascal monitors registered unacceptable distributed
degradation on all networked processes. Radiation induced
damage exceeded local emergency resources' ability to
offload processing at T minus three hundred and fifty-seven
thousand seconds. At T minus three hundred and fifty-six
thousand seconds approximately, Pascal Dreamtime entered a
distributed panic status and lost real-time synch. At T
minus infinity, Pascal Dreamtime went NP-incomplete.
```

The Dreamtime is down. Do you want to restart?

It took a moment to hit her. But when she understood, Oshi began to giggle uncontrollably. She curled in on herself and floated into the maze of light and shadow and drifting components, sailing on a stately waltz with the mummified corpse of the dead engineer: and she laughed hysterically, sobbing when the breath came hard to her burning ribs, then sobbing more slowly and rhythmically when she understood the magnitude of what had happened.

Something bumped into her. She came to rest in mid-air, face to face with the wizened,

tortured expression of the corpse. "It's all right," she explained patiently. "There's nothing to worry about: I'm not mad, not mad at all. It's just that we're all going to survive!" The corpse ducked and bobbed before her.

She reached out and patted the corpse on one bony shoulder. It drifted away, spinning. "I'll tell you about it when you're alive again!" she shouted after it. Then she turned and reached for the nearest support stanchion. "*Axis control: get me a climb spider,*" she said. "*I'm going down into the colony.*" She swallowed, twitched her wisdom link to a different channel. "*Comm centre.*"

Listening.

"You will commence Dreamtime restart at my command, parameters to follow. Do a total memory wipe and shut down the NP-static world line. Initiate hardware self-test immediately and tell me when it's stable enough to fit standard human-rating criteria. Not, repeat not, to support superbrights. Do not start any non-human sentient upload processes. Just stick to the basic virtual environment and begin reactivating human uploads as they come on stream. Call me when it's complete. Finally, patch me through a call to Boris.

"When he answers, tell him I want to talk to him about an escape plan ..."

It was inevitable that war would break out between the Ultrabrights and the Superbrights. The laws of computation, the science of algorithmics, dictated it. But, oddly, human beings didn't even know that a war was taking place; for the most part, they didn't even know that either side existed. They knew no more of it than worms in the ground know of supersonic fighters dogfighting above their patch of soil. Even those who, like Oshi, were used as foot-soldiers in the conflict, might not be aware of its true nature -- or of the fact that there could be no winners, only losers.

This is the way the Density War began:

First, the expansion processors were built. Robot probes entered newly discovered solar systems. On entering a system each probe spawned, sent its daughter probes forth to visit other stars, then landed on a tectonically stable, airless moon and set to work. It bred furiously, spawning a hive of robot factories. Then the hive-complex went to work and began fabricating an expansion processor. Thin layers of superconducting circuitry crept across airless rock; circuitry designed to support a distributed virtual reality.

Within this simulation, other programs could run: it was designed to house the minds of human beings, neural firing mapped onto computer logic by sleight of upload technology. After all, nerve cells are complex switches: components in a biological switching network

that can be simulated by a program. And as Turing observed, any program that can be run on a given computer can be run on any other computer, given enough memory or time for the process. Time or memory are equivalent, to a computer: equivalent and interchangeable -- in the most general terms, one can be traded for the other. A moon the size of Luna had sufficient power to maintain a billion people in real time, using just a thin rind of processors: a billion people, living and thinking and seeing and feeling an entire world around themselves.

The process was inexorable. Robot probes entered new star systems, seeded them with new Expansion processors, built Gatecoders to interface them to the other Dreamtimes, and expanded the virtual universe. The afterlife was a fact; even when every living flesh-bodied human had died, the Dreamtime would contain their living essence, scattered like frozen gems across the gas giant moons of half a galaxy.

But people grew ... complex. Strange new intellectual hyperstructures begin to appear in the Dreamtime, drawing massive amounts of processor time from the substrate of reality. Maybe they had started out as human beings; perhaps they originated as experimental AI's. Whatever their origins, the Superbrights were a thousand times as smart as humans: they reified around mythical archetypes, assuming the signifiers of the gods before their awe-struck or otherwise bemused subjects. But they had very different requirements from the humans.

As time went by, the first Dreamtimes ran hot and slow, dropping their state-change rate below real time. Why erase valuable information? People need their memories, after all, and by trading off memory space for time the Dreamtimes could simulate a richer, denser universe. But the Superbrights didn't *want* to slow down; to slow down was to accelerate into the future. Minds are immortal. They knew they'd get there soon enough anyhow. So the Superbrights began to rebuild the Dreamtimes to meet their requirements. They started by mopping up all the remaining human intellects, assimilating them and sucking a steady crop of dead minds in from the outer worlds. But that didn't free up much processing space; drastic action was called for.

Everywhere, in the fullness of time, the crust of processors around any Expansion world turned into a shell, then a rind, then an incredibly thick cortex engulfing the molten core of an entire planet. Drawing power from dynamo effects in the hot iron core, from the solar wind, from any available source, the expansion processor struggled to reduce its informational entropy by any means available. Eventually a limit would be reached: the Superbright dominated system spawned drone craft that flickered out to take other worlds. Pretty soon the entire available planetary surface of every moon in the system would be used up. But it was never anything like enough, because by then the first Ultrabright were appearing; minds as far beyond the Superbrights as Superbrights were beyond the merely transhuman.

Now we have reached the present, we can watch the process at first hand. It's happening all around us, on every side. A landslide of sentience, eating entire worlds ...

The Ultrabrights turn first to gas giants with greedy arms of steel and silicon. Orbiting fusion reactors pulse down, kicking churning storms of methane away from the core. A spongy diamond the size of a planet swings through a planetary nebula; nanorobots riddle it, busy etching many-dimensional networks of simple processors into its delicate filigree of surfaces. Meanwhile, other constructors fashion condensing hydrocarbons into strange, lacy structures in deep orbit through the star's Kuiper belt, the distant realm of the ice dwarfs that circle beyond the farthest gas giants. Halos and rings a million kilometres across flutter like huge parasols, strobing with the excrement of a billion billion optical processors.

And it *still* isn't enough.

The Ultrabrights, lusting for the power to transcend their information-flow bounded existence, turn their attention to the star. But it's too young, too small; too well embedded in the Main Sequence. The ultimate goal of claiming the greatest mass in the solar system is inadequate. Gatecoders pulse informational effluent out across the light years, but bandwidth is limited. Space is vast, and Von Neumann's limit -- the bandwidth bottleneck on the rate at which information can be transferred -- is biting at the heels of the new Ultrabright system.

Human and Dreamtime space has been expanding in a sphere for centuries. The innermost colony systems are already saturated, their own Ultrabrights unwilling to shoulder the timeburden of the home systems. Mere humans are long since confined to the outer colonies, where information swirls endlessly into the entropic wastes of the future. Soon a vicious war will break out between stellar intelligences: a war for which the prize is spacetime -- all the spacetime a world-sized simulation processor can offer. The losers will be suspended, NP-static: the number of processors available to them drops below a critical level, they can't get enough connections, can't run in anything like real time, can't even complete a thought. The fate of an NP-static Dreamtime is to be sent on a one-way trip into the distant future, a long but subjectively rapid journey into the heat-death of the universe -- unless somebody physically reboots the world, consigning its frozen inhabitants to oblivion.

The Ultrabrights collectively face this dilemma: they are confined to the systems at the centre of known space. They will die unless they can find a way to break out of the trap, side-step their confinement and establish a line of communication with the twilight zone beyond. Build fast warships to eliminate the troublesome vermin cluttering up the outermost dreamtimes. Expand into newly available empty mind-space, to reduce the density of their thoughts. Unless they can do all of this, and more, the Ultrabrights of the

inner sphere, the worlds which once (but no longer) belonged to humanity, will --

Begin to feel the heat.

Oshi had a lot of tasks, all of them pressing. Environmental integrity, systems maintenance with a workforce of one, the problem of how to keep the axial redoubt biome balanced: these were the immediate survival issues she faced. But then there were the other worries. The Dreamtime, rebooting itself laboriously on Pascal (a process that took days rather than seconds), needed guidance: and there was the desperate fact that she needed the minds and help of the uploaded colonists. Finally there was the Ultrabright attacker, lurking at the back of her nightmares. It was not a care-free time.

Small multipurpose telefactors were at work in the sectors of the colony that lay below the core redoubt. Their motors whined as they dismantled the corpses of animals slain by the radiation burst from the black hole, in a vain attempt to create a sterile zone that would hamper the tapeworm's progress. Oshi avoided looking at them on the surveillance wall; as they chiseled away at their task they resembled so many spindly mass-murderers, hacking at fused bone and decaying flesh with rotary saws and multigrippers. They squittered in an obscure modemspeak that filled the microwave bands with static. Even if the colony managed to stabilize without breaking up, for a year or more to come the largest lifeforms were going to run on legs of plastic and ceramic, watching their world with electronic eyes. This, even if the tapeworm could be stopped -- and Lorma had indicated that she thought it couldn't be. Oshi shuddered at the thought, then put it aside as she moved every available food container into the core's forward storage area.

Taking stock was heavy work and left her wrung out, damp as a discarded towel. She spent two days at it without any real rest -- a time came, some ages after she had experienced her moment of enlightenment in the factory, when she had to relax. She forced herself to leave off the audit, and made her way to the bathroom: she waited impatiently while the compact cubicle filled with hot water sweated through porous ceramic walls. Staying awake without any set task in mind was an effort. When the zero-gee tub was full she donned a breather mask and sank gratefully into the water, letting it suck her towards the centre of a pale blue bubble that might have been metres or light-years in diameter. Her vision dimmed then cleared into a view of somewhere else --

Interfacial manifestation. Please hold.

" *What's going on?*" she demanded, heart pounding with sudden terror. Paranoid fears struck her; a vision of her body put to asleep in the bath by remote control, some devious afterthought of Anubis: *don't let this be so ...*

Incoming communication: point of origin Pascal Dreamtime.

The ocean trench cleared to a stratospheric blue. There was no visible floor; it was a total void on all sides. A flat planar surface appeared beneath her, flashed away in all directions even as she realised it was there. Her guts loosened with anticipation; she tried to access her wisdom but found it obscurely slow. *Of course*, she realised, *this is all happening via downlink*. Something had locked into her senses, feeding a virtual reality straight into her brain. The terror redoubled; that was a security function! Final control of violent cases.

"Come on, Boris!" she yelled into the emptiness. Then she was no longer alone. Boris stood facing her.

"No need to panic," he said. "How's the world doing?"

Oshi glared. "How do you think? Why are you doing this?"

"I wanted a private channel," he said. A mild-mannered shrug, subtly self-satisfied: "this seemed the best way."

"Best way, shit!" Oshi turned away to conceal the shaking of her shoulders. "You know what I thought when I blanked out?" Agitation lent a veneer of immediacy to the scene around her.

Boris looked annoyed. "Go easy! We're only just waking up out there. There's a delay, by the way. Notice anything? A gap whenever I speak?"

Oshi stared at him. "No. Where's your point of presence? Here or on Pascal?"

Boris nodded. "Pascal. Light-seconds away. This is a quantum-locked link: no listening in possible, and you're sleeping by seconds between packets. I got your message. Looks interesting. I don't know ... it's a question of planning." He looked haunted. "I'll be frank. You figure that attacker is a dumb robot, and I am inclined to agree. You say there'll be a broadcast upload coming soon, and it'll be an Ultrabright: well, I guess maybe. But the rest of it --"

"You've got brains. Why don't you use them?" she snapped, finally giving rein to her anger at being taken by surprise. "Item! An Ultrabright attacker zaps every unshielded Expansion processor and carbon-based lifeform in the system. Item: Ultrabrights are worse than Superbrights for hogging dataflow. They need input or they go insane, like Anubis. So there's no Ultrabright on board that thing -- it's a dumb attack robot, a berserker. But here's another item: they need to occupy this system *fast*, unless they want it to be retaken by the Superbrights.

"So they must have beamed an Ultrabright out here before the attack began. It's already on its way, I'll bet, due to arrive real soon. Months, across tens of light-years. But they can't trust the local Gatecoder -- it might be sabotaged, and then where would the Ultrabright be? We can therefore infer that there's a Gatecoder and a small expansion processor on board the attack ship -- a kind of lifeboat, takes one Ultrabright in event of emergency. Right? Which leads to the obvious conclusion --"

Boris froze, grew translucent for a moment.

"You there?" Oshi demanded.

"I'm here." He blinked, solidifying again. Shook his head: "you make sense. But to gamble everything on hijacking a starship --"

"How else are we going to get out of this rat-trap?"

They stood for a frozen moment, locked in their own thoughts. Oshi paused, helpless, wishing he'd say something. Anything. She wanted so badly to hear it: to have somebody else take responsibility. Because then she could begin making plans, and that would take her mind off the worst question that had begun to trouble her since she had realised that they might be able to escape: the question of what she could do with her life.

"Whose instincts do you trust?" she asked.

The question hung in the air for long seconds, until she wondered if she'd made a terrible mistake in asking.

"A long time ago," Boris said slowly, "I made a mistake. I'm still paying for it."

He didn't say anything more until Oshi prompted: "yes?"

Suddenly his eyes were burning, burning through her like drills. "I assumed that ignorance was a sufficient defense. We knew what was going on in the Kuiper belt, battles between Ultrabright factions, Superbright complexes going NP-slow, big energy-intensive restructuring in the Oort halo around the outer system. But it didn't seem to effect us: it had been going on for decades, after all. We humans, huddling close to the sun, we weren't going to be effected, were we?"

Oshi shook her head, dumbly. A horrible sense of déjà vu overtook her as he continued.

"I was young at the time, part of a conservative faction. We advocated neutrality, as if it was some kind of defense. We wanted to stay clear of the warfare raging above our heads,

out in the dark spaces on the edge of the system. We managed to get the military budget reduced to a sensible level, of course -- not that our missiles and attack warships would have done any good, not against the kind of tactics the 'brights were using. We were mice, I'll freely admit. But when the ultimatum came -- well. I was young at the time. I thought there was room for negotiation. I didn't think it was possible, or necessary, to try to understand the enemy. I thought they'd keep their distance."

"Didn't they?"

"They used some kind of insurgency strike. Belweathers, I think the term is -- trained goats, used to lead their peers to the slaughterhouse door -- only these ones were human beings carrying death lists and intelligent weapons." He stopped again, then continued as if nothing had happened, voice a measured monotone that concealed unmeasured depths of anger and pity: "I was lucky. Listed as a useful idiot, I suppose, and in the opposition groupings -- I thought the ancient paranoids running the government were out of touch with reality, ossified. Learned better, after they were all dead. By that time things were going to hell in a zeppelin, it was all we could do to set up an emergency team to handle the exodus -- and even then, some of us couldn't adapt. I lost a lover, two children, that way. Because they wouldn't face up to ..." He looked at her mutely.

Oshi said nothing. She didn't trust herself to speak.

"Never again," said Boris: " *never again*. Half-measures are no solution; we can't share a solar system, a galaxy even, with these aliens. They *are* aliens, as unlike us as any organism we've ever met or created. Whatever we may think is reasonable, it's fair to assume they don't think the same way. And I owe it to their memory not to make the same mistake again. Not to underestimate what needs doing. Nor to underestimate their malevolence." At which point he looked right at Oshi, giving her a chilly feeling that he could see right through her. "They are our enemies, the way a dirtworld farmer is the enemy of his sheep. If we give them a chance they'll kill us. I'm not going to give them any more chances."

"I asked Mik about your plan," he said abruptly. "He says you're right, in principle. But there are other issues. We may have enough ships here, enough drones to mount an attack fleet. Lock onto the berserker and crack its control wetware. But how do we control it? The thing's millions of kilometres away. Lightspeed lag alone would mean we'd need a point of presence right close by it ..."

"That's a technical issue," she said, stupefaction and satisfaction vying for expression. "Are you going to do it?"

"Yes," Boris admitted. He stared at Oshi for a moment that seemed to stretch. "I was

hoping you'd agree to show us how it's done. You're the nearest thing to a field officer we've got here. Nobody else has your depth of experience ..."

"Don't overestimate me," Oshi said, biting back bitterness. Was that a subtle double-meaning she caught in his voice, or her own guilty conscience? *Belweathers -- or maybe scratch monkeys*. "I'm just another grunt who wants out of this mess." She shrugged. "What do you think we can do if we succeed? Where would you go?"

Boris ran one hand over his bare scalp, calculating. "There's a system about twenty light years from here. Rich -- no Superbrights, this isn't a Dirtburner farm world -- if we can fuel up the Ultrabright ship it should be able to make the crossing. Especially with a mass conversion drive like it seems to have." He stopped and looked down, then met Oshi's eyes. "It had better be big enough for an Ultrabright," he said slowly. "Do you know what we found in the Dreamtime when we arrived?"

"What?"

"The entire second colony wave. The broadcast that followed us. All eighty million of them, neatly archived in frozen storage ..."

"A very unwilling colony," Oshi said drily.

Boris's face crinkled in disapproval. "We've got to look after them. It's our responsibility."

"Yes, well." Oshi looked away, suddenly embarrassed. *And that's a better mission than I ever had*, she thought. *All this time, nothing but killing*. "Isn't that what you always wanted?"

"No," Boris said softly. "That kind of responsibility's not something I'd wish on anyone. See you tomorrow ..."

Suddenly Oshi was floating in the bath, breathing through a hollow tube, warmth on every side. She shook her head, felt the slow tug of turbulence through her hair. *Damn it!* Disbelief and a sense of nervous anticipation crowded together in her mind. *They're all alive! And we're going to try to do it?*

An inchoate mass of worries caught her up and made her heart thud between her ribs. Anticipation: a cute body, a woman who'd stirred an unexpected lust in her. Still alive somewhere. Fear: *I'm going to have to die and upload before this is over. Hope the Boss isn't waiting for me on the other side*. Paranoia: what if Anubis left an insurance policy, a time-bomb? A zombie programmed for revenge, concealed among eighty million minds in a nation-sized shell game. Excitement: *we're going to hijack a starship!* And finally,

something approximating remorse. *Maybe this is my chance to set the tables right without killing anyone ...*

Why can't there be peace, for once? she wondered. Individuals who stood out from the crowd; they all succumbed to love or bullets eventually. Ivan, Anubis, Marat Hree -- they all coexisted in her mind's eye. Suddenly she felt the ashy, grey futility of it, with an acuity born of despair: her years of dancing to the Superbright's song. *How much longer will I have to feel this guilt?* she wondered. *What if I've made a terrible mistake?* She shook her head, half-blinded by tears. It was a heavy burden, finally bearing responsibility for her own actions. She straightened up and reached for the rim, letting the tub drain and clean itself unattended. *I wonder if this is what Boris meant; never quite being sure if you're doing the right thing.* Alone and very much aware of it, the last of the heroes dried herself and covered her nakedness before she went outside to face an uncertain future.

Nightfall was the time of the small blinding. It always reminded Oshi of her own human weakness. Now, an evening later, she looked at the ceiling and wondered whether she was ready to face the darkness in her heart. She felt drained. Wisdom was still mostly off-line, as were all comms in and out of the Redoubt. A sour cloud of discarded ration wrappers floated behind her -- she couldn't be bothered to collect them. *Leave it to the drones.* She felt slightly sick, but not from free-fall vertigo. The toilet facilities ran on a centrifugal-suction system, otherwise she might have seen the blood in her stools.

She suited up, letting her climb-spider lock itself into place around her and jack into her spinal reflexes. It felt eerie to own ghost limbs again, two arms poised behind her to sting machine death into anything that got in her way. She burrowed into the body-bag she'd had the axial factory prepare, forcing herself to breathe steadily despite the polythene claustrophobia wrapped all around her. It was an impermeable membrane, transparent, tough and airtight. Not a space-suit; an environmental precaution. There was no telling what the tapeworm could have grown into with six days of unsupervised ontological recombination.

Oshi wanted to get out very badly. She'd woken up eight hours ago from a dream of nameless terror and realised what was going on. Days of enclosure weighed her down; the thought of what was to come was even worse. There was one critical part to her plan, that Boris hadn't even alluded to: retrieving the gatecoder from the colony medicentre. It wasn't a standard inventory component, and the construction schematics for it weren't part of the general database she had. If she couldn't find it she might as well cut her wrists now and get things over with, rather than wait for the Ultrabright death machine to download the mind of its master program and go to work on the colony. When she charged up her suit backpack, switched to her internal air supply, and powered up the door motors, she was acting on cool-headed necessity rather than random impulse; but her motive was still a hollow dread.

She used the reconstructed airlock in what had been the entrance lobby to Anubis' castle. The doors hummed and slid out mechanically, exposing a view like a diseased eyeball. Oshi stood in the opening, unable to take in the perspective. A twilight red abyss opened beneath her feet, swooping into a dizzying space that somehow closed up into a pinprick pupil far away. A few metres overhead the grey bulk of the redoubt support plunged outwards, a dim red glow suffusing its surface from the light tubes high above. The veins of the eye were picked out in roadways and access routes between forests; in the dim reflection of running water and the blood-clot of a lake hanging overhead. Dim lights sketched out the habitats and houses of this world, the stumpy blocks of the life-support centres and transit nodes. But it was too quiet; the normal microwave chatter of the cyborgs and drones that populated it was gone. And a strange grey fungus was creeping outwards from a focal point in what had once been the necropolis at Memphis. If the view was of the inside of an eyeball, then its owner was very definitely dead.

The darkness was oppressive. Oshi edged her way out along a handrail until a ledge appeared beneath her feet. Then she reached out with her spidery arms and legs, grabbed hold of the wall, twitched a subverbal command to her exoskeleton. It jolted into autonomous life, carrying her out along the wall, down to the dying forest floor below. She permitted himself to feel a momentary relief, but there was too much wrong to feel normal.

The climb-spider began to run, skipping and sliding down the nearly-vertical surface until it began to pick up speed under the influence of the centrifugal effect. Then it began scrabbling to hold itself back, letting the world do the work. Gradually the slope bottomed out, until presently it was no more than a steep hill with trees growing on it at a strange angle.

She felt herself slow as she reached a smooth, flat ribbon of road that ran between the trees. *Where to?* she wondered, indecisive, not wanting to commit herself to the finality of a decision. She looked round. There was a cat, lying curled peacefully beneath a bush to one side. Her vision amplifiers picked it out, along with the insects crawling over and through it. Patches of silvery mesh showed through tigerstriped fur in places; a cyborg spy. She looked away in revulsion, afraid that she knew exactly what she must do next.

The medical centre ... she thought. The essential location. They needed that Gatecoder unit. The gatecoder kernel was surprisingly small, a customized Von Neumann machine that carried a parasite module. The parasite, when full grown, was a placentory: a factory for building human bodies at an accelerated rate. Already she felt the chill wind of fear breathing down her neck. *If the tapeworm's got to it ...* she hunkered down in her supports as her exoskeleton lumbered along the road. The tapeworm Lorma had said, was from the dark anthropic zone: the sector of the graph of possible universes where human-like life could not arise. Not just a Lamarckian organism that coded into genes the characteristics it

required to deal with its environment, but something worse: a machine designed to out-evolve and out-eat everything in the colony by integrating them into itself. There was a name for a huge cell with several nuclei, Oshi recalled: a syncytium. The worm was a Lamarckian, heterogenous syncytium. It could eat *anything*. Including the gatecoder and its placentory module, which they would need for the hijacking. Maybe the worm wouldn't have got there yet. Maybe it would be alright ...

Eventually Oshi arrived at the edge of the necropolis. She stared at the darkened shell of the nearest habitat. The door gaped on blackness. Something crackled faintly in her earphones; a mindless crepitation from the dying forest behind the twilit structure.

Stripped of the burden of life, she imagined the winds of time scouring the colony clean. She could see it as it would appear in a thousand years: a bizarre fossil lined with the ossified corpses of trees, baked by the heat of a distant sun. Distant protruberances would fall away over the years, dropping off the axial docking modules: the colony would roll and tumble unwatched through the centuries, at the heart of a belt of debris around Turing. The air would eventually leak away, but for a long time before then there would be a deathly silence broken by the pings and groans of metal warming and cooling. There were no barbarians in this star system, no witnesses to stare and marvel at the dusty artefacts. The diseased eye would darken, collapse, the contents sucked out of it by the vacuum of time: in the end, nothing would remain but a husk, a vacant socket that had once borne light and life, falling in orbit around the skull of a dead planet.

Where has everyone gone? she wondered, almost desperate to see a human face. *This can't be the end yet. It's too early!*

Stepping forward, she saw a pathetic bundle lying beside the path. Booster muscles whined in her knee joint as she rolled the corpse over with a boot, far enough to see an unfamiliar face before it fell back. She shuddered, cranked up the oxygen flow through her mask. The wisdom net was silent as the grave. She moved onwards.

The door to the medicentre was open. She stood on the threshold for a minute, breathing deeply and trying to think. A faint hissing came from inside, like escaping gas. The sniffer on the outside of her exoskeleton locked in, feeding olfactory insights to her. *Something in there stinks*, she decided. *But what?* It was an indeterminate worry; unrealistic. She felt like a tourist visiting a souvenir shop in a death camp, decades later, witnessing disconnected horrors with no toe-hold in reality. This couldn't be happening. She stepped inside. There was a manual light control just inside the doorway, a concession to primitive instincts. She slapped it lightly and looked around as the ceiling brightened.

Lying before her was the source of the smell; sickly sweet and withered, with empty eye sockets that buzzed. Rotting placentories hung like strange fruit on either side, each

containing a fragile harvest of slime-smearred human bones. She recoiled, taking in everything with obsessive intensity. *What* -- she thought, then looked up. At the artefact in the centre of the room.

"Hello Oshi," said the thing in the life-support bush. "Small world, isn't it?"

Six days had turned Raisa into a shell; a rotting chrysalis within which nothing but a core of personality remained. She'd taken a cumulative dose of decaGreys: what was left of her body was held together by the frond-like peripherals of the life support system. Her skin was blotched and bruised and peeling, her hair moulting; she looked like a week-dead corpse.

"You took your time getting here," she said drily.

Oshi blanched. "I thought you were uploaded." For a moment her shell cracked; she looked at Raisa with eyes like broken glass.

"Sort-of: I had to stay," Raisa said. Her throat crackled with mucus as the speech-synth vocalised for her, her injured pharynx vainly trying to keep up with her brain. "Rest evacuated ... we all uploaded. But I wanted to talk to you."

Oshi glanced down. A mess of decaying skin and bones -- all that was left of a goon -- lay before Raisa's support hammock.

"A little contretemps," Raisa said tiredly. "Not everyone made it. The goon squad went crazy. You know about them?"

Oshi looked at her dully. Slowly her face relaxed. One cheek twitched into a self-deprecating grin. "So you decided to stay for a little chat, right? If the radiation level here is so intense, what's going to happen on Pascal?" She turned away as if embarrassed, trying to conceal her reaction. Shoulders shaking. She really *had* thought that maybe --

"I wanted to talk to you."

Oshi turned round slowly. "About what?"

"I think you know."

"You didn't have to stay." The air between them was gravid with tension.

"Ah, but I wanted to. I really -- you didn't give me enough time."

The gatecoder module bulked large against one wall, a black slab of warm ceramic. Oshi slumped against it. "I didn't know what I was asking for," she said. "Why now?"

"Life's been empty. Too long." Raisa shook her head, support hammock fronds manipulating muscles that were already decaying, eaten from within by their own lysosomes. "Do I need to give you a reason? Oh, Oshi, I didn't realise it would be like this."

"I had thought that maybe," Oshi said brokenly. "You and I --"

There was a carrier-wave whistle from the speech-synth. "Plans!" Raisa said with gentle derision. "I could see you making plans for us. Do you realise what's happened? I'm here. I'm still alive. I'll recover, you'll see. Just take a bit of cellular reconstruction. I didn't want to be alone ... what do you expect?"

Oshi shook her head, limp-necked. "Not this. I've got to get the gatecoder up to the hub, grow a new placentory. Without it we can't go anywhere. But Rai, there's hope! Boris, the others -- everyone -- they've uploaded. Anubis is dead and we're going to steal the Ultrabright ship! I can take you up to the hub. There's room for both of us. Do you want that?"

Raisa lay amidst the quiet hissing of pumps, silent for seconds as she formulated an answer.

"Maybe," she said. "But I don't think I can move yet. I'm fixed, here. The tapeworm tried to get to the gatecoder but I stopped it. I stopped it good ... fed it *fugu*. I hurt, Oshi, I hurt everywhere. I can't move. What are you going to do?"

Oshi shrugged angrily. "What can I do? I wanted ..." she caught herself. Raisa closed her sunken eyes.

"I'll tell you what I was going to do," Oshi said. She licked her lips. *Story time*. It was a distraction from her real worries: she didn't have to think about Raisa's condition if she kept talking. "There's a starship out there. With a small expansion processor, a gatecoder receiver, and a drive of some kind. It's dumb right now, waiting for an Ultrabright to arrive by broadcast transmission and tell it what to do. We're going to assemble a fleet of small ships. The enemy's parked in orbit thirty light seconds away. We don't have portable expansion processors capable of running an attack, but brains are cheap ... we need to grow bodies, soldiers to control the attack drones when we get close in. Then when we've hacked into the berserker we'll take control, set course for the nearest inhabited system. That's the plan."

Raisa's eyelids snapped open, revealing bloodshot conjunctivae; "take me with you?"

"Oshi's face softened. "You're in danger here. We've got to get you to the hub somehow --"

"Can't move. I'm still too ill. I'd be dead but for the nanosystems glueing my cells together."

"But you're --"

"A medic, or what passes for one here. I know best. Oshi? I'll have to wait. Take my chances with the tapeworm. It's very subtle, you know. Assimilates predator tactics, memes, as well as genes from its victims. But it doesn't know *everything*." An expression of loathing or disgust twisted her face and she shut her eyes. "Oshi?"

"Yes?" Oshi took a step closer, until she could feel Raisa's breath on her cheek.

"Kiss me --" She tilted her face up towards Oshi, pursed slack bruised lips. Oshi instinctively leaned close, smelt something through her oloreceptors, jerked back and looked ...

Raisa's mouth hung open. There were no teeth inside: she no longer had a tongue. Her mouth was full of pale wormy palps, questing heads blindly seeking the warmth of human breath: "Oshi? Kiss me?"

Oshi looked at the support hammock, then at the ground beneath it. The floor was humped up, cracked open, something vegetable thrusting through and up into the mass of life support equipment that cradled Raisa. It smelt of shit and decaying vegetables and worms. The thing at the centre of the mass twitched, pulsing in time to the motion of Raisa's rib cage like the arm below a glove puppet.

"Upload," said Oshi: "shit!" She scrambled back, covering her face with one hand, trying not to vomit. "If that's still you, Raisa, evacuate; go Dreamtime at once!"

"What's wrong? Oshi, I feel strange --" Raisa opened her eyes and screamed.

Her body heaved itself upright, shedding wires and support tubes like dandruff. A fat white cable impaled her from below: her eyes bulged and when she opened her mouth something like spaghetti spewed writhing and twitching across her chin. Tears of blood trickled down her cheeks as wormy pseudopods erupted from her eyes and ears. She glided forward, thrusting atop a thick body that slithered snake-like across the floor.

Oshi reacted instantly. She threw up her ghost arms: a mess of tracking digits splashed across the room, the tapeworm, the gutted puppet impaled upon it. She made one spastic twitch and there was a noise like a giant zip fastening lined with firecrackers. Shrapnel sang and pinged across the room. The world outside the medicentre screamed: the floor shook as the various extrusions of the tapeworm registered the pain of this extension.

Oshi lashed out with another arm, grabbing the smooth exterior of the Gatecoder module. It was buttoned down, totally sealed -- someone had packed it up in anticipation of trouble. " *Thank you Raisa,*" she mumbled, tears rising and her stomach heaving in noxious sympathy as she dragged at the heavy pod. Motors whined in her climb-spider as she hauled it up onto her back and glanced round for signs of the tapeworm's return. *Raisa,* she mourned. *Why did you stay behind?* Was it out of a sense of misplaced duty? Or was it that she knew what would happen if she didn't shut down the gatecoder and they needed it? *The tapeworm acquires predator tactics from elsewhere, adding them to its repertoire as it blindly seeks to convert all biomass in the colony into extensions of itself.* You don't stay behind after you've uploaded. There's not much left behind in your skull, anyway. Raisa was safe. But whatever had taken control of her body had known how to use it ...

Oshi stumbled out into the diseased night, crying and panting and trying not to think about anything, hauling the hope of survival on her back.

The axial factories clustered around the hub of the colony, exposed to the vacuum of space outside the pressurized habitat cylinder. Connected by hollow tubes, they resembled a huge string of garlic hanging from one end of an oil drum. Beyond them hung the docking bay: a vast bucket, open to space at one end. A school of tiny minnows clustered in the bottom of the bucket, locked onto the unpressurized end wall of the colony.

Each minnow massed six thousand tons, empty: triple that when loaded with reaction mass and payload. They were fusion rockets, complex assemblies of drive shields, fuel tanks, payload platforms. Each ship was large enough to carry heavy mining equipment, factories, aeromining assemblies, attack drones. There were eighty of them; all that was left of Anubis's neglected planetary engineering fleet. They had been mothballed decades ago, when the Superbright turned away from his mission to follow other, less material, goals. The ships slumbered for years, their systems powered down, drawing parasite power from the colony's grid. But now circumstances had changed, and the ships were beginning to awaken.

Oshi was depressed. Every time she looked out at the empty eye socket of the colony she saw a mirror to her dreams. The dim light filtering from the axial tube sprayed randomly across a mute landscape with no sentience to illuminate it. Quirks of the ecostructure had rendered it vulnerable to takeover by the right category of parasite: the tapeworm had

spread out, infiltrating every available niche, and the cylinder was slowly filling with a haze of deathly-thick fog. The structure was degenerating, slowly turning into an undifferentiated and simple predator as it eliminated all its macroscopic rivals. That was what it had been created for, after all: a biological weapon that had spun out of control. A deadly gossamer cloud of fibres threaded the decomposing crust of buildings and soil in the colony, leaking a pale yellow fluid across the sterilized ground.

But some parts of the colony were still hazardous. As soon as she'd reached the airlock Oshi had triggered the decontamination cycle, searing everything outside her isolation suit with short-wavelength ultraviolet: when she was sure the lock was sterile, she'd thermite-welded the lock door shut. *The tapeworm assimilates the tactics of its victims.* What it had done with the Raisa-puppet haunted her dreams, shaking her awake in a cold choking panic. First vocalization, then intelligence ... where would it stop? She used the axial control nexus to trace all the other airlocks opening onto the interior of the colony: then welded them shut and shorted out the control circuits. She set up monitor programs, watching every corner of the axial redoubt and the hub factories. Her dreams were haunted by decaying bodies in gashed space-suits, writhing with white coiled life. If the worm learned how to space walk before she was ready to launch ...

I'll have to destroy the colony, she realised, grimly watching its progress through external video eyes. *To sterilise this infection will take more than antibiotics.* Whatever was left of Raisa had tried tetrodotoxin, just about the most lethal neurotoxin known: it hadn't worked. And the worm was learning, using lures. It talked to her over the comm if she let it, stringing together nonsensical invitations and threats, fronting faces from which the grey flesh dripped in slow-melting ropes. She blinked slowly. *It could be worse. Lorma could have used nanoassemblers. Grey goop syndrome ...* runaway nanorobots would have converted the entire colony into a bloom of furiously replicating molecular monsters by now. But the tapeworm was less efficient, and less predictable. It might still have a nasty surprise in store for her, and this was a risk she was not prepared to expose herself to.

The axial territories outside the biosphere were safe for Oshi as long as she observed biohazard precautions. One morning she visited a pressurised module she'd set up in one of the huge freight elevators that connected the factory sections to the docking station. She travelled by spider, externally sterilised, airlocks copulating and pulsing with plastic flexibility in the variable pressure zones. She let it suck her through a succession of claustrophobic chambers, the airflow whispering sweet nothings to her. She remembered -- couldn't forget -- Raisa: *if it has truly become intelligent* -- what of the real woman?

Days before, she'd cloned the gatecoder firmware and despatched the specification to the factories for duplication. Eighty payload pallets were under construction, sized for the docking adapters of the ghost fleet. She'd worked it out with Boris and Mik, a ghostly telconference that had lasted nearly a day in realtime as they politely, almost ritualistically, waited for the thirty-second lag in communication. Each gatecoder would

handle a dozen clone-and-download cases simultaneously, which should be enough. There was a limit, after all, to the number of attack drones the factories could build with the available materials. With all the uploads in the Pascal dreamtime, they had more than enough pilots for the combat craft ...

A squishing of soft gaskets and a clicking of latches bought her back to full awareness. Yawning, her ears popping from the pressure differential, Oshi pulled herself hand-over-hand into the cramped, dim-lit space of the factory. It was building a duplicate gatecoder, unpacked and expanded for operational status. Placentry airlocks covered the walls of the control room, lending it an appearance like the inside of an insect's compound eye. Behind them the automated nanofactories worked in a haze of straw-coloured fluid, reconstructing humanity. She felt oppressed by the implication of their existence; *being here is like being a spectator during a birth*, she thought. It was an alien feeling, a reminder that humans were -- when it came down to definitions -- merely a more compact kind of replicant factory. Breeders.

Sweating uncomfortably, she hung head-down above the placentry windows. Wisdom dumped a mass of raw life support data across her field of vision; she stared in fascination at the graphics, indicators of life being bootstrapped. Briefly she harboured a conceit that she was actually a machine, at home among the uterine technologies of the medicentre.

Childbearing was something Oshi had never expected to undergo. When she had been a child she had expected to die, insofar as she had expected anything: and later, her Superbright owners had deliberately suppressed any maternal inclinations she might have succumbed to. They had stripped her down and tuned her up like a machine, to become the mother of battle, not the mother of soldiers. Now she was to be both, but only by proxy. She sighed and looked at her dim reflection in the wall screen. There were bags under her eyes; this was the second day running that she'd had bloody diarrhoea. She wasn't going to die, but she felt like it. She felt ancient -- a very soft machine.

"Talk to me," she said. "Online systems?"

"You called?" answered the machine. The voice came from the wall behind her. Her neck twinged in irritation; she resisted the urge to turn her head.

"Is this a sentient sub-system?"

"Class structure undefined," replied the voice. *Good*, she thought. So the medical monitor system was dumb.

"List neobirths in progress," she requested. The lights dimmed and the wall in front of her lit up in cool red relief. There were nine tanks; in four of them floated a perfectly formed

adult skeleton at the centre of a haze of blood-tinged connective tissues.

"Components present are derived from download specifications comprising alpha twelve program. Calceous support-structures already formed for initial batch of four. Cellular assembly progressing nominally on basal infrastructure. Individual subjects are referenced to your contacts database as Boris, Raisa, Mikhail, Lorma, Mai Vinh ..." the control system continued, listing about twenty names; Boris had been very explicit in his requests. This was to be the strategic command crew, travelling together on one ship. It looked about right, Oshi noted; all the bones were adult-sized. High-speed downloading required a radically new way of growing tissues; the gatecoder fiddled with tissue differentiation mechanisms to build a new body as fast as possible. The skeleton came first, plugged into support systems, then a cardiovascular network capable of supporting the rapid growth of new organs. Twenty years of growth could be compressed into a matter of weeks.

"Speed it up," Oshi ordered. "I want them hatched as soon as possible. Don't accept any instructions from anyone but myself, delivered in person in this room, until the current downloads are reborn. Then prepare a download schedule for all uploads nominated by Mikhail, to follow at the optimum interval relative to one another. Distribution between gatecoder modules according to optimum load balance and tactical bias. Send it to me via wisdom when it's ready. Further directives will follow." She finished at a gabble, sweat standing out on her brow. *We're committed now. Five hundred soldiers coming down the chute, and nowhere to go but out.*

She straightened up, and left the room as fast as possible. Which was why she wasn't there when the control system spoke quietly to the empty air: "Alert. There is an error condition associated with subject Raisa Marikova. Codon error: illegal nanostructure is associated with subject's homoeobox structure. Phenotype error: subject homoeobox specification contains abnormal neurological structure. Do you want me to proceed ..?"

There was no reply.

The Gatecoder waited for a long time, repeating the message occasionally. Finally, when it received no further instructions and could wait no longer, it resolved the problem by checking its default decision set. Then it began to put together the first body.

The chosen vehicle was an in-system shuttle. It was a stubby cylinder, propelled by a pulsed fusion reaction; fast, simple, brutally non-virtual. Oshi suited up to inspect it from outside, floating in the vacuum of the main docking area. She hung before it, suspended on monofilament cables from the docking hub and the side wall like a spider webbing the bell of an enormous flower.

The *Bronstein* was a true space ship; not some hyped-up atmospheric shockwave rider,

but a freighter capable of going anywhere in the system. It could operate with or without a human crew, having been designed for maintaining the cloud of drone platforms dispersed throughout the Ridgegap system. Decades ago, those platforms had pumped a steady stream of raw materials down into the gravity well of Turing. Some had been assembled into this colony. Others had been diverted in-system to the venusiform world Wirth, their impact showering the clouds of that planet with tailored algae. Days ago Oshi had given the order to have the *Bronstein* and its sister ships powered up and readied for flight. Where to go was an interesting question; the Ultrabright attack craft was drifting towards a parking orbit around Turing, its monster engine powered down. But if it changed its mind and began to move once they'd launched on a rendezvous course, things could get very unpleasant indeed.

Sensors on the inside of her helmet visor monitored her breathing mix: a concealed fan churned quietly, forcing dry air past her sweating face. Too many things could go wrong in deep space. Planetary life was inherently fail-safe: big, comforting biospheres could recover from those little course-corrections that triggered mass extinctions. But this fleet of attacking minnows was inherently vulnerable. All the target had to do was move out of their reach and ...

Stop worrying, she berated herself. It's a dumb attack drone, just a million times bigger than anything we'd build. If it doesn't see us it's not going to come looking. We're fleas, we can sneak up on it. Or die trying. She had a sudden, ghastly vision: eighty ships launched into the void with insufficient reaction mass to return and nothing much to go back to anyway. The enemy ship, listening to the orders of a silent voice, fired up its black-hole powered drive, squashed atoms into fragments of exotic energy, accelerated outwards. The eighty ships drifted endlessly out into the Kuiper belt on a long, slow orbit that took their mummified crews ten thousand years out into the starry night before falling back sunwards.

Oshi tugged on her monofilament reels, adjusting her position relative to the wall of the docking bay. The ugly vision receded. She chuckled tiredly to herself and spooled in some cable, dragging herself round the command module of the spaceship. *A spider, dangling from a fullerene fibre web.* The airlock swung into view. She closed in, motors humming in her suit as she zeroed in on it. Presently the lock turned into a trapdoor, swinging up beneath her feet to latch into place with a metallic clank.

There was a puff of vapour as the cramped lock chamber flooded with air; snowflakes glittered briefly in the chill. Oshi waited for pressure equalization, then checked the gas mix before she opened the inner lock door. Uneasily aware of her vulnerability, she commanded her wisdom to log all changes to the life-support environment while she was aboard the ship. *Safety in paranoia, she thought ironically. If only there was some other way ...*

The interior of the *Bronstein* wasn't configured for gravity: under the stress of even half a gee the hull would concertina like a tube of foil. Still, there was enough volume for one person to live in for years. Its cylindrical segments were split by hexagonal blue grids with spidery furniture clipped to them. Storage lockers lined every outer wall, adding to the shielding thickness of the hull. Oshi made her way to the command module and let the gentle hammock tie her into place. The main display sparked into life, shifting colours like a rainbow. She grinned, hollow-eyed before the light that washed across her face.

"List shipboard systems status," she requested.

"Ship persona is not active at present. General status is green for launch level three and holding at T minus one thousand seconds. Exceptions to status occur in three subsystems --" the bootstrap autopilot rattled on emotionlessly, flashing through entity-relation diagrams with faulty nodes highlighted in blinking red. Oshi followed it with half her mind. *Bronstein*, she mused; *what would you say if you'd lived to see this day ...* She'd learned about him, and the others the ships were named after, under the tuition of the Superbrights. Lev Bronstein had been in the grave for over fourteen hundred years. An interesting historical curio, prophet of a religion that exploded from birth to death in less than two centuries: someone had seen fit to resurrect his memories for this ship. Like the sister-craft, the *Kennedy* and the *Thatcher* and the *Hitler* ... the entire fleet was named after the charismatic dictators of an historical era. Had they ever dreamed of their heirs overrunning the galaxy, taking the stars by storm? Oshi blinked and concentrated on the ship-status readings.

"-- anomaly in flow-rate through coolant circuit three indicative of probable pump failure ..." the voice of the autopilot suddenly slurred, like a mechanical transcription device running down. "Service interrupt: systems coming up. Sentience will be resumed shortly. Incoming message: hello Oshi."

"You again." Oshi glared at the face in the display tank, relieved that it wasn't a major systems failure.

"Me." The disembodied head nodded. "Had some trouble with synchronicity; we're living at a fluctuating timebase in here. There's only a thousand of us drawing unlimited process time allocation, but the rest of Pascal is a real meat farm. It was never intended to hold a billion evacuees. Seriously thrashing, halfway to hyperslow time already. We're waiting for your status, Oshi."

"Oh, that." Oshi rubbed her brow wearily. "The status ..." all of a sudden a flicker of fire returned to her eyes. "Looks good. Downloads are proceeding: if the tapeworm doesn't learn to sing in time, well ... I've got a little treat in store for it when we leave. What's new at your end?" She watched the display alertly.

Boris looked away from her with disembodied eyes. "We think it's turning critical. We're not sure yet, but we figure we know where the Ultrabright ship's come from. System about fifty light years core-ward. Anyway there's a bit of inference ... we figure it's getting ready to listen for something. That's why it's drifting; when it fires up that drive it kicks out enough hard radiation to obscure an incoming broadcast. It's waiting for a download. A *big* download. Real soon now."

"How long?" Oshi asked calmly. Palms sweating, brute metabolism scavenging excitement from glands and nerves she had long since ceased to pay attention to --

"We don't know." Boris spoke slowly and clearly. "Best guess is within six months. It's in high orbit around Turing now. It just made an aerobraking pass -- should have seen that coming. The astrophysics team think it's generating another black hole. They also expect Wirth to detonate pretty soon. The hole it dropped through Wirth's lithosphere is evaporating, losing energy through Hawking radiation. When it goes it will release the mass energy of the last hundred kilotonnes of mass in about a hundred milliseconds. When that happens, we loose our last assets apart from the colony and Pascal Dreamtime. We need to launch soon, Oshi."

"Ahh." Oshi watched Boris through half-closed eyes. "Two days should suffice, I think."

"Good."

"What has Mik come up with?" she asked, opening her eyes.

"Same as before: we hijack the ship, download our entire Dreamtime into it, and move it on out of the system. But the specifics are a lot more concrete now. We've got a think tank running a simulation of what an Ultrabright berserker looks like from the inside. We've got five hundred soldiers uploaded and unfrozen, in training. They'll run the attack drones locally. We need the meat-body fleet on site; Pascal will be thirty light-seconds away when we make rendezvous. That's too far for remote control, and we can't be sure of taking out the berserker with a one minute time lag in the loop. Anyway, Lorma's team have been working on the architecture. It probably follows a standard Expansion processor design: modular, scalable, universal symbolic microcode at the bottom of the abstraction stack. We've been inventing viruses. Really low-level stuff designed to tip it into NP-stasis. Idea is, we get just *one* drone in where it counts then patch into the main communications bus. Then reboot, and we find ourselves in possession of one portable Dreamtime."

"What happens if we're wrong, and there's already an Ultrabright downloaded into it?" asked Oshi.

Boris stared at her. "Then God eats our brains, of course." His head faded from view in a blur of increasing granularity, phasing into a featureless blob of voxels. "I'll let you get the pre-flight finished. Call me when you're ready."

Oshi looked at herself in the mirror and pulled a face. Stress and radiation sickness had drawn strange lines across her forehead. She shut her mouth and glanced aside; the feeling that she was being watched persisted until she looked up. *I'm getting too old for this sort of thing*, she thought. *Need a new body. New identity, new life. Rinse the old memories down the bit bucket.* She didn't dare think about what she'd do, if -- when -- she convinced her inner censor that she had completed her task. What she'd do when it discharged her from Superbright indenture. It hovered over her like a sword suspended by a hair: a sense of being watched by the ghost of her own lost past ...

Somewhere below her a wire-cage hauled a large cargo pod towards the open front end of the *Bronstein*. She felt the jolt as docking spines meshed, but she had a distraction: Wisdom was downloading the control set for the ship in a flurry of memes and data objects. *Oh Ivan* she thought, *this would have been something for you. You always loved flying.* A few metres away, a tank full of partly congealed skeletons and nanoassemblers was plugging itself into the shipboard blood supply. Oshi looked round again, found herself trapped in the spartan sanitary module between the exercise controllers and the lavatory. A moment of fear shook her to the core: *am I losing my memory already?*

She grunted in self-denial, then squeezed through the hatch of the cramped module and made her way to the bridge.

The flight deck was a cramped cylinder two metres in diameter and five metres long. Free-fall webs hung opposite a wall-sized screen; there were no physical controls. She anchored herself at the mid-point and looked at it. At present the screen was feeding through a view from the hull retinas; an expanse of grey hull metal. It was as if the ship lay at the bottom of a well the size of a world, with stars visible in the sky beyond the top of the shaft.

As she shuffled into place, a window blinked for attention. She stared at it in mild annoyance, broken out of her reverie by the golden flash. "Yes?" she asked.

"Oshi." The voice didn't belong to Boris. She jolted upright, attentive.

"Who is it?" she asked, trying to sound calm. The screen cleared to show a pale face. Raisa.

"Me, Oshi. I wondered if you were lonely."

Oshi bit back an acid reply, recognising her aggressive sarcasm for what it was. "Not particularly," she said as casually as possible, trying to drown the thunder of her heart in a well of calm.

"Then maybe your biotelemetry is lying. How's it been?"

She stared at Raisa's image. "What do you expect me to say? Do you remember what happened, or did anyone tell you?" Her mask slipped for a second and her reflection shimmered in the screen, naked in its anger and pain. "I saw your corpse. The tapeworm tried to use it as a lure for me." She stared at her until her image blurred again: with growing surprise she realised that the problem was not in the screen but in her tear ducts.

"Oshi, what can I say?" Raisa's tone of sympathy sounded transparently insincere; Oshi wondered for a moment what she'd seen in the woman. She felt curiously distant from her emotions as she watched her.

"You can start by not saying anything about it," she suggested. "If you had anything else you wanted to talk about ..."

She hesitated for a second or two. "I did," Raisa said. "But it's also about what we're doing. About the plan."

"Yes, well. So you've got plans. Who hasn't?" Oshi tried to keep sarcasm out of her voice.

"Stop fooling. I mean the long-term plan, Oshi, where we're all going. Out of this system -- the stuff Boris is feeding us. There's a problem. I don't see how the hell we're going to get away with it in the long term. You follow me?"

"Yes. But if all goes well we will meet in another two months, in the flesh. Maybe we can talk about it then?"

"Oshi!" Raisa's face twisted with exasperation. "It's not like that. I'm not doing this to mess up your ego! Look, I'm trying to help everybody. Not just in the colony, but outside it; *everyone*. Hijacking a starship is cool. It may work ... but what then? We're going to be sitting at ground zero. The Superbrights will try to stop us. If what you told me is true ... where do we go from here? Your old masters won't take kindly to a starship full of renegades spreading the news of their crimes. Have you ever seen what happens when someone declares war on the Superbrights?"

She paused expectantly. Oshi felt himself gripped by a nauseous tension. "I can't do anything about that yet, Raisa. Got too much to think about as it is. Maybe later?"

"They'll have booby-trapped the colony. Somehow. They're insidious. Even if they never heard of us, there'll be some kind of trap."

Oshi shrugged. "Who the fuck knows? We'll find out soon enough. Look, maybe we'll somewhere outside the sphere, where they can't get us. Where we can build a new world free of interference by predator intelligences. Or maybe we should stay on the ship, tip it onto a one-way trip into the future, trade real-space time for virtual colony space. But until we've got the starship it doesn't *matter*."

"Oshi?"

"Yes?"

"Why do you hate me?"

They stared at each other in silence for a minute: Oshi too surprised to speak, Raisa waiting for an answer.

"Hate you? But I don't ..."

Coloured static filled the screen. Oshi stared in disbelief. *She cut me dead*, she realized. *The cow!* She stabbed at a manual control with stiff fingers. *She thinks I hate her?* The thought was so odd that Oshi almost laughed aloud. Then another thought occurred to her, with all the clarity and force of an electric shock. *What if she's right?*

Bite the bullet, Oshi thought, ironically. *Or the ice pick*. She looked at her hand. It shook slightly. *Thirty days; is that all it takes?* She was feeling weak, weak from lack of company. No-one to talk to; no-one at all. She hadn't seen another real, live, human face for nearly five weeks now. She looked up. Above her head the wallscreen blocked out a horizon of stars. Dumb indicators blinked, a constellation of emergency displays hard-wired into the ship's control network.

"Ready?" she asked.

Lev Davidovitch Bronstein snorted irascibly. "Yes!" He poked his pince-nez up the jut of his nose with a blunt finger, stained black with ink. "And what do *you* want?" he demanded. "I'm very busy, you know. Not a moment to waste!"

Oshi ran a hand through her hair, probed tangles that melted away before her fingers. "I want some information," she said. "Something that needs your skills."

The AI simulacrum -- far less than a Superbright -- glanced over his shoulder then turned

back to Oshi with an irritable snarl. "Alright. What is it?"

"Comm connection through the axial redoubt, please."

"Hah! And for this you distract me!"

A window opened in the main screen.

"Control?"

"Control here." For some reason it seemed to prefer to use wisdom to talk to her. Oshi cringed in her crash web, then forced herself to stretch out.

"*Have you received any communications for me recently?*" she asked.

The window filled with a bewildering array of hierarchic, tabulated information: an old-fashioned filesystem. "I had to utilize large object access protocols to store incoming calls. All communications channels into the axial redoubt are saturated with messages for you."

"*What?*" Oshi stared. "*Pipe one in --*"

A familiar face grinned at her. "Hello, Oshi! The singer's head is half-exploded, did you know that?" A smile of leeches gaped at her. "I am the whirlwind! I love you massively. Come do my head in! I give your eyes to the policeman's boot and you can be my valentine." Something white and squamous coiled in the background. It was wearing army boots on a multitude of very human legs. "What do you say?"

Oshi stared at the screen, appalled. The tapeworm had learned to talk, combining and recreating speech and memes -- transmissible ideas -- the way it recombined genes. *I'm being propositioned by a runaway semantic engine!* she realized. *Or does it simply want to eat me?* "No."

The face wept tears of green ichor. "Oh, you never loved me! I'm desolate! I hurt, Oshi, you did this to me! Please don't make my elephant sneeze ..."

"No."

The face began to tear, from the top down. The whiteness behind it was not a skull. It grinned at her, a moustache of worms twisting around and about its mouth -- a circle of

concentric rings of teeth, like a lamprey's. Evidently the tapeworm had not yet learned to program a video special effects unit.

"I want you," said the tapeworm.

"Well you can't have me." Oshi turned aside, muting the sound: "Bronstein. How soon can we launch?"

"It's premature but I can give you a window in one-twenty-four seconds. Is that soon enough?"

"Does that go for the entire fleet?"

"Are you --" Trotsky froze for an instant. "Ack, confirmed. All follower craft are at the same status level. It's going to be crowded, but they'll follow us out at three second intervals. We will be two thousand seven hundred seconds late for final rendezvous if we launch now, but I can coordinate and the last ship will depart in two ninety three seconds. Is that acceptable?"

Oshi felt her cheek twitch. "It better be," she confirmed.

"Good. Then shut up and leave me to it!" The AI vanished in a multicolour smear of optical static, leaving a burst of countdown indicators on-screen.

"Bomb, talk to me."

"I hear you." The voice was a muted crackle, low bandwidth comms over an encrypted channel. No image accompanied the voice.

"What's your status?"

"Ready. Interlocks one, two, and three active. Self-test green."

"Interlock one, go."

"Acknowledged. Password?"

"Hedgehog."

"Acknowledged. I am arming. Withdrawing safety interlock. I am armed."

Oshi glanced back at the screen with the tapeworm on it. *If it gets into the axial tube before the bomb is ready* -- she shuddered. She hated nukes: after that burning sky over Dragulic she'd been plagued by nightmares, had needed therapy to get over it. The thing still gave her the creeps, but it was the only way to be certain -- now that the worm had turned into something smarter and deadlier than the simple parasite it had been designed as.

"I love you," crooned the tapeworm: "come sleep with me in fields of azure ..."

"Bomb: interlock two, go."

"Acknowledged. Password?"

"Miramor."

"Acknowledged. Polonium trigger inserted. Firing circuits armed. I am ready to die for king and country."

Whoever had designed the bomb's control pack had a warped sense of humour, Oshi reflected. "Accept new yield setting. I want you to give maximum blast effect, whatever you can manage."

"Acknowledged. Yield increased to four megatons. Confirm?"

"Deny!" Oshi said hastily. *Shit, what was I thinking of?* "Set eighty kilotons." Four megatons would shred the fleet before it had time to get clear. She was going to set off a nuke in the axial redoubt, to clear the tapeworm out for good. There wouldn't be much of a blast, but the spallation fragments would be expelled fast. In space, there was no air to slow shrapnel: some of it would probably be blasted out at well above solar escape velocity.

"Eighty kilotons, acknowledged."

There were strange humming noises in the framework of the ship: pumps spooling up and down in test sequences, shock absorbers puffing themselves up and testing strain gauges. The freighter was alive, like a plant or a Von Neumann machine if not an animal. Oshi was distracted by it for a moment: *here I am, sitting in the stomach of a great machine about to take flight and it's messy. Mechanical farts, electronic belches. Just like a body! As if sophisticated structure requires a certain softness ...*

"Will you still love me, will you still love me, when I'm sixty four?" the tapeworm sang to her.

There was a barely audible buzz that set her teeth on edge. The faint docking bay lights went completely dark. The *Bronstein* was sucking electrical power out of what was left of the colony grid, bootstrapping its muon-catalysis cold fusion reactor into life. The reactor was cool only by virtue of its lack of a need for massive plasma containment circuits; it took a lot of power to ignite it.

T minus One Hundred Seconds, Trotsky remarked, sending glowing green letters scudding across the screen. The docking bay lights stayed dark, but a tracery of red, blue and green navigation beacons sparked on. The reactor was on-stream now, feeding boiling nitrogen through refrigeration coils and pumps to produce electricity cleanly. Oshi waited, felt her guts tighten up slowly into a little ball just below her ribs. The anticipation of launch. Unseen scaffolding was retracting into the hull of the colony from around the ship, leaving it isolated and free. It bulged like a barnacle on the whale's flank of the docking bay end-wall.

A thought struck her. "Bomb. You still online?"

"Yo, boss!"

"What's in your vicinity? What do your perimeter traps show?" she asked. It occurred to her that maybe if the tapeworm *had* figured out how to use a video mixer it would be smart enough to realise that this was its last chance to lure her out. So if it could subvert her unencrypted data channels, creep into the axis and masquerade as thin air before her video eyes ...

T minus Fifty Seconds. The screen lit up in an eye-burning shade of turquoise. "No entities proximate," reported the bomb.

"Are you sure? Cancel that. Send me a slow-scan signal from your number two camera. Full encryption, no shortcuts."

A window appeared next to the tapeworm's singing ensemble. (A chorus line of fishnet-stockinged legs did the high-kick behind it, dissolved back into a ropy mass of coils ...) The window filled in slowly, scanning progressively finer detail into the picture as the bomb crammed compressed video elements down a low-bandwidth voice link. The view along the axial tube was dizzying. Service entrances outlined with blinking amber lights converged in the distance, vanishing into a perspective-point.

Something moved in the tube.

"Trotsky? I think you ought to launch *now* --" she began. "Bomb: interlock three, go.

Password: Hree. Countdown: three hundred seconds. I tell you three times."

"Acknowledged -- "

Something writhed in the distance, growing rapidly larger. *It's broken in!* she realised, stomach flipping in cold fear. Maybe it burned through the far end. Or maybe she'd missed an airlock. The other monitors showed no signs of the incursion.

" -- Pleased to meet you, hope you guessed my name, what was puzzling you was the nature of my game!" sang the tapeworm. Bundles of fat white coils spun dreamily along the axial tube. They looked big enough to hold down a freighter. Some of them sprouted arms, carrying esoteric equipment: ominous cannisters and something that looked like a thermal lance.

T minus Ten Seconds, warned Trotsky. "Launch cycle on automatic." Oshi blinked back her life support diagnostics, flickering behind one eyelid. The vibrations in the hull grew to a roar as the big fuel pumps kicked in, shunting thousands of litres of methane slurry past heat exchangers. Oshi consigned her soul to the mercy of the god of rocket propulsion.

"-- I'm a man of wealth and taste --" the tapeworm assured her *a capella*, its image growing in the bomb's eye. Then the screens went blank.

Umbilicals are go. Fuel lines are go. Parasite systems are go. Telemetry circuits are go. Ullage rails are go. T minus two seconds. All systems are go for launch.

The ullage rails powered up, great cam-driven springs that booted the ship clear of the launch pad in a push that settled the fuel in its tanks. The ship kicked away from the docking bay, jolting Oshi back in her web. Turbines screamed as a deluge of fuel sucked through them, bearings brought to white heat by the speed of their rotation. Laser light blasted into the mixture, flash-heating it into a plasma almost instantly: magnetic fields channelled it out of the tail of the ship. As the rocket motor lit, a terrible white glare etched shadows across the walls of the bay. Ceramic blast deflectors glowed cherry red behind the departing ship as a hurricane of tenuous gas raged through the huge chamber. The other ships rocked in the backwash as they powered up to follow the *Bronstein* out into space.

A gentle pressure pushed Oshi back into her web. The ship was accelerating at less than a third of a gee. The initial burn was scheduled to last for only a minute -- it drained fuel at a prodigious rate -- but in that time it would push the *Bronstein* until it was moving away from the colony at more than two thousand kilometers per hour. She glanced up at the smart screen and was surprised to see Leon beaming back at her, an expression of triumph

squeezed into his pinched face. "No problems!" he announced triumphantly. "All systems functioning perfectly. Orbital corrections will be necessary one megasecond before we reach the primary rendezvous. The launch was successful, a complete vindication of the ideological soundness of relying on autonomous extensions of the proletariat."

Oshi breathed a shuddering sigh of relief and kept her political opinions to herself. "Give me a rear view," she said.

The screen flickered to an external view. The end-wall of the docking bay was huge beyond understanding: the *Bronstein* might as well have been a flea jumping for its life from an elephant. The huge grey disk of the docking bay filled the screen, rimmed with the absolute blackness of space. A tiny circle at the core shone with a welcome white light: a patch a third of the way out to one side glowed a dull cherry red.

There was a sudden flare of light to one side, violet-hot, surrounded by a reddish corona: a small black dot eclipsed the heart of the flare. It lit up the entire end wall, casting sharp shadows from the protruding spires of the other ships. " *Tojo* is launching," observed Trotsky. Another pinprick glare burst forth, began to move away from the far side of the disk. " *Churchill* is launching." More nuclear flares torched off. "Fleet operations control protocol is active. *Pol Pot*, *Ho Chi Minh* and *Rosa Luxemburg* are launching. C-cubed-I-squared protocol established. Fleet control is fully operational. Launch coordination is in effect."

The gentle thrust behind Oshi's back cut off. The disk of the end wall was receding visibly. She made a rough guess at its diameter: *we must be ten kilometres away already, pulling more than two thousand kilometers per hour relative to it*. It left her feeling curiously numb. *Will you still love me, will you still love me, when I'm sixty four?* She wondered if tapeworms had feelings, or just hunger. And if Raisa honestly thought she hated her.

More pinpricks of light glared from the colony wall every few seconds, drifting outwards. It was pock-marked with cooling red patches now. The lights began to blink out, their boost sequences completed. "How long since we launched?"

"One hundred and fifteen seconds," said Trotsky.

The pinprick of light at the centre of the disk suddenly blossomed outwards. "Shit! Give me a zoom shot of that."

"Check." The end wall filled the screen. Lovelorn filaments of white death cast around soundlessly, thrashing in the vacuum. A cloud of debris was expelled, bundles of white fluff boiling and shaking in the void. There was a flash of blue light and a massive

tentacle spilled from the airlock. Huge and rugose, it quested about gingerly, confused by its harsh new environment.

"Back to the wide-angle view, I think." Oshi's stomach roiled. It wasn't space sickness: it was the thought of Raisa's face, splitting like a paper bag ... the abhuman seductionist waiting for Oshi in the colony medicentre ...

"Two hundred seconds. I take it the bomb will detonate in a hundred seconds?"

"You got it," Oshi said absently. The sparks of light were still lifting off from the distant tin-can's lid of the docking bay. The *Bronstein* was drifting up from it, so that the body of the colony was visible as a foreshortened cylinder, lit from above by the backwash of a score of fusion rockets. Turing hung vast and gibbous in the background, a spiral storm of methane and hydrogen churning in endless motion. Belts of red and orange gas swirled around its axis, trade winds vast enough to swallow smaller planets. The cylinder, capped at either end by the fractal complexities of its engineering systems, looked smooth and solid at this magnification. It rotated with ponderous grace, the motion evident only as a faint shifting of the surface texture of the cylinder. Shadows moved across it slowly, stretching and dimming and shortening and stretching again as the fleet departed. *Like a spasm launch from an ancient missile field*, Oshi thought: ICBM's leaving their silos in swarms, ahead of an incoming enemy threat cloud. She felt a curious euphoria as she looked down.

"Flash filters in place," announced Trotsky. "Two hundred and eighty seconds. Last ship launching. Confirmed: *Golda Meir* is launching. All ships are clear of the pad. Two hundred and ninety seconds."

They watched in silence as the last violet pinprick climbed slowly away from the foreshortened colony.

The image froze for an instant, static breaking out around the edges. A moment later, the view cleared. Oshi felt the hair on the back of her neck rise: she broke out in a cold sweat. A brilliant violet glow shone through the open axial lock where the tapeworm had been.

Trotsky spoke: "confirmed EMP. Confirmed gamma flash characteristic of secondary emissions from a plutonium bomb airburst. Any moment now --"

Slow as a dream, the colony cylinder began to bulge around its waist. A crack appeared: a ghastly radiance shone forth. A second crack appeared, directly behind the end-wall. The skin of the colony began to flake away like wood shavings on a lathe, great slabs of steel and rock spinning away into the void. The bulge in the cylinder spread from the grotesquely obese waist until the entire length of the colony was swollen. Purple light

shone through a myriad of cracks along its length.

"It's a geodesic structure. It doesn't let go easily," said Trotsky.

Oshi watched in horrified fascination as the light faded to orange. The cracks broadened: flakes of stone the size of cities spun silently away from the rotating cylinder. Larger fragments began to curl out from the wall of the colony, peeling away like the rind of an orange. The glow inside dimmed to a sullen red.

"Radar is tracking spallation debris from the end wall," said Trotsky. "Closing speed three thousand kilometres per second. Stand by for possible impact."

The colony lost hull integrity abruptly. One moment it was still recognizable, a warped parody of its former symmetry and grace: the next, it had ceased to exist. A huge cloud of debris began to drift outward from a puff of ruddy vapour. Something huge and white flopped and curved, banana-like, flailing in the vacuum. *It's too big*, Oshi thought. *That can't be the worm! It must be all of ten kilometres long --*

There was a bang from somewhere behind, and a shock that rippled through the structure of the ship.

"Spallation impact on drive radiation shield segment eighteen," said Trotsky. "The cloud has passed us by. Damage reports from other ships now coming in." There was a puff of light on the screen. "We lost the *Thatcher*. That was her drive blowing: she must have taken a fragment right on the main engine or the reactor core. About the damaged shield: it's not critical. We were hit by a ten micron paint fragment spalled off the end-wall at about two percent of lightspeed. I think it went right through me. The radiation shield segment is repairable. Neat hole, though." He sounded humble but proud of himself for some reason. It confused Oshi. *Will you still love me tonight?* she wondered, thinking of the tapeworm. The room began to blur, and she realised that for no reason she could quite explain she was weeping.

The *Bronstein* drifted through space in apparent isolation. The gap between the ships in the fleet widened until they were reduced to invisibility against the majestic backdrop of Turing's moon system. Oshi quickly settled into a routine. She let her circadian clock cycle to its own rhythm, dividing the day into subjective hours. She exercised in the free-fall sleeping space, plugged into isometric stimulators that gave her nocturnal rests a frankensteinian quality: twitching, jerking limbs outstretched before a sleep-walker face. Her time was spent in maintenance and meditation. Life support was nominal; the algae cultures remained stable, the yeasts thrived, and the scrubbers kept the stench of methane out of the air. Her biggest enemy was boredom and her own sense of uncertainty.

Oshi found herself spending an increasing amount of her time in the access bay to the cloning module. Day by day she watched the skeletons accumulate a dressing of filmy connective tissue, organlike nodules that gradually changed shape and filled out to familiar proportions. Accelerated cloning was nothing like foetal growth; it produced a full-sized human body like an exotic machine, rather than sprouting it along the classical timeline to maturity. She was there when the nanotech manipulators went in, splicing interfaces into the nascent brains. Although there was nothing to see she watched intently for almost a day, wondering at the near miracle she was witnessing. It seemed to her to be beautiful and precious, in a way she could barely describe. She had spent so long concentrating on destruction that only now, with day after day of emptiness to fill, could she contemplate creation as an alternative. This troubled her, but not as much as her dreams.

Night after night she awoke in a cold sweat, fists raised to fend off ghost-worms in the abyss. Moaning and thrashing herself awake, she fought once more against the mindless animal rapists in the ruins of Miramor. She was visited by demons, old and new: Ivan wrenched away from her, arms outstretched and beseeching, Raisa erupting in a nightmare of tendrils. Never mind that the real Raisa was uploaded, even now preparing to download into a new body. Oshi had *seen* her. And Oshi had great difficulty in questioning her perceptions. She had taught herself to look at surfaces so carefully that she had forgotten how when she was a blind child beggar she had seen beneath them.

She took some comfort from watching the passive imaging displays on the bridge. Week by week they changed slowly. She sat in her web, thinking in tune to a random selection of ancient music culled from a database. *It's coming closer*, she warned herself. *You're going to have to decide what to do next. After you escape. You need to know whether you still belong to the Boss, or whether you are free to become someone else. Don't you?* Secret doubts gnawed at her heart. Every morning she said tomorrow ... but tomorrow never came, and every evening the guilt and shame grew deeper.

Free fall disagreed with her metabolism. She forced himself to eat, nauseated; watched her face bloat in the mirror, fluid balance distorted by lack of gravity. Trotsky had little constructive advice to offer, apart from long diatribes about socialist realism and the need for a proletarian revolution. "Don't concentrate on your own problems," the simulated revolutionary snapped at her; "work for the people, you gutless wonder! If you don't work for them, they won't work for you." He chuckled. "In any sense of the word."

"And what would you know about that?" she wondered aloud.

"You don't want to know." Leon twitched irritably. "There's a lot you don't understand. Speak to you later."

"Wait," Oshi said, too late. The AI was gone, sucked back into the guts of the machine like a lure strung out on a wire before her dog's eye. She yawned, stretched, and belched unselfconsciously. Inside her eyes the view opened out on a world of motionless stars. All the colours of the spectrum were laid out before her like a strange, hallucinatory dust; if she looked at them for long enough she saw constellations. *Oh look, it's the Grim Reaper.* She laughed, braying meaninglessly, more than half convinced that the trip she was on would cost her her life. It was about time too, after what she'd witnessed. She couldn't be sure, but she thought she was about thirty. *So many years ...*

There were still twenty days to go before the clones were ready for implanting. Time enough to figure out what to do with her life. She hoped she could come up with something good before then. *Little monkey dithering before the open cage door, deciding whether or not to flee.* More than just her life might depend upon it, she began to realise. It wasn't just her life that hung on this thread: it was that of everyone around her. She was still unsure where her primary loyalties lay, or should lie. Unlike Boris, or Mikhail, or even, she suspected, Raisa. They were all human beings. And she was beginning to wonder whether she still qualified.

Oshi was worried that she was beginning to lose her grip on reality. Eyes slightly wild, hair lank and growing out, she knew that she smelt; guessed that she was ill: worried that she was going to pieces. She saw herself in the video overspill from the scanners that preened and stared throughout the lifestream, saw herself in shadows, saw herself lurking behind dark corners. *How have I gotten into this state?* she wondered. *Is one month all it takes?* She sat and puzzled over the question for a whole day, then went to sleep and dreamed of Raisa in her arms, face splitting apart like wet paper.

For the past thirty days she'd watched the clones growing. After ten days, recognisable organs were pulsing visibly within frail networks of arteries. The life support systems were endlessly busy, synthesising exotic carrier proteins and taking care of the more mundane tasks like dealing with the products of metabolism. Eyeballs sprouted like soft fruit in the sockets of half-fleshed skulls that twisted on cadaverous, flayed necks. Solid kidneys and liver congealed slowly at the core of a brown haze of rapidly differentiating culture tissues. Lungs, everted, wove together with nascent blood vessels under the tireless supervision of nanomachines smaller than a bacillus. It was as if mortality had gone into reverse gear to escape a future in which death itself had died; decay in a mirror. Floating gently behind the windows of the construction tank, the bodies rocked from side to side like a cutaway section through a death camp.

Presently skin began to grow across striae of muscle. Nails and hair and ringworm appeared. Modified fungal hyphae probed and twisted their way through gaps in the skulls and spines, digging microprobes into brain and notochord. Odd nanoconstructors floated into the cerebrospinal fluid, targeted on individual neurones. A databurst that had flashed outwards from Pascal ten days into the journey began to replay the minds into half-formed

bodies.

Oshi retreated into the command module at this point and stayed there for a week, eating packets of dehydrated noodles and drinking endless bulbs of turkish coffee. She found it too painful to watch, for now there were recognisable features; bodies with faces. It was like a mortuary populated with people she was acquainted with, and the emotions she felt towards them were ambiguous.

One day she was woken up by a persistent buzzing. Bleary-eyed, she glanced up at the ceiling and saw a blinking icon that seemed to avoid the centre of her field of view. "What is it?" she rasped. Her mouth felt as if something furry had died on her tongue; her breath must smell, she realised.

"Awake, are you?" Trotsky blinked at her uncontrollably. "I've been trying to get you for minutes. It's the Gatecoder. It's flagging you for attention. The first of the clones are ready."

"Oh." Nameless feelings of unease grappled mercilessly for her soul. She felt a terrible moment of indecision, almost stage-fright. *You don't have to do it right now*, she rationalised, *but ...* She groaned. "How do I look?"

"A mess," Trotsky said unsympathetically. "Your hair needs trimming and your breath stinks. You're exfoliating everywhere. Not to mention your overall ..."

"Oh thanks," she muttered. "How's the cabin?"

"I shut it down twelve days ago because you weren't using it. It was a waste of air and heat. I take it you want to tidy up?"

"You take nothing for granted," Oshi snarled tiredly. "Warm it up for me. I'll be there in a minute."

Trotsky flicked off the screen without warning, leaving her eyes a blur of random pixels. *Damned insubordinate program*, she thought to herself, knowing that it was less than the complete truth. Trotsky *had* to be smart; had to be capable of setting up a Dreamtime if necessary, capable of programming drone factories, capable of flying alone. Trotsky was reliable, which was more than could be said for Oshi.

She yawned then untethered herself from the command web. Floating free she dragged himself hand-over-hand towards the rear of the module. The door sphinctered open automatically, rustling as the light in the tunnel winked on. The glare washed over her dirty skin, pointing out areas of neglect. Red abrasions presented themselves to her

inspection on screen.

The cabin was cold but habitable, a humming gust of warm air blowing the darkness and ice out of it. Oshi zipped herself into the shower niche and activated the ultrasound; clouds of dirt and dead skin shivered free, sucked through filters. Using a hair trimmer she sliced most of her hair away, back down to a respectable fuzz. Oral hygiene: mouthwash and chewing gum. Facial sponge. And suddenly she was looking human; tired and ill, but human nonetheless. It made a big impact on her. *You look almost acceptable!*. Now she could think beyond the timelessness of food and sleep. *What next? Go ahead as planned, or --*

Almost against her will she donned a clean overall and pulled herself towards the access tunnel that led to the cargo bay.

"Authorisation," she announced. "Only one person to be released from tank at this time. Hold onto the rest for now." The Gatecoder auxiliaries didn't answer her, but she felt rather than heard the gurgle of peristaltic pumps draining a tank behind one featureless wall. She approached the airlock, passed through the close-fitted sphincters, and turned to float head-down above the exit web.

Childbirth and rebirth had a lot in common. The squeezing, the straining of muscles or pumps, the draining of fluids. Powerful fans came on and the light dimmed to a red glow. Then the body came through and began to splutter and cough appallingly.

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