

CRI DE COEUR

Michael Bishop

?

Why, once, did moths sing the tapestries of their wings in candle flames? Why, once, did the cinder-laden parachutes of fireworks so excite us? And, again, why did certain crazies—fools or saints—sometimes steep themselves in petrol and torch themselves to carbon?

Why, in short, do we long to blaze?

Ever since I turned twelve, I've known. Only a minuscule fraction of the stuff of our universe glows. The rest, the bulk, drifts in darkness, unmoored or rudely tugged. The cold vast black of interstellar night cloaks it from our eyes, our telescopes, our roachlike searchings. We belong to the part that does not glow, to the swallowing dark.

Why wonder, then, that a yearning to leap into the furnace, to god-fashion ourselves in fire, drives us starward on the engines of a mute cri de coeur?

"Whurh we guhn?" Dean asked me.

"It's a surprise. Have a little patience."

"Huvh uhliddle"—he grinned up at Lily—"payshuhns."

Excitedly, I gripped one of roly-poly Dean's hands. Lily Aloisi-Stark, my son's mother, a systems specialist, held the other. Dean swung between us like a baby orangutan, a creature habituated *in utero* to a starship's sterile bays, bioengineered for life aboard a space ark.

Except that he hadn't been. After more than an E-standard century of travel, U.N.S. *Annie Jump Cannon* and the other two great wheelships of our colonizing armada pulsed a mere three years from a rendezvous with the Epsilon Eridani system. The brakes were on.

Along with U.N.S. *Fritz Zwicky* and U.N.S. *Subrahmanyam Chandrasekhar*, *Annie* was slowing to keep from overshooting our target, a world where Dean might find himself ill-suited to cope. Of course, I had to admit, that might prove true of all of us.

I led Lily and Dean up a rampway and thumb-keyed the panel of the topmost room in G-Tower of *Annie's* rotating wheel, a structure so large that the sight of any portion of it always summons my awe.

We entered the observatory. A scaffold supporting the enameled barrel of the ArkBoard Visual Telescope (ABVT) reared over our heads.

We rode an electric lift up through this scaffolding to a carpeted platform with chairs, handrails, and a large shielded viewport. At the platform's other end, two men stood talking at the base of a ladder to the ABVT's sighting mechanisms. One man I knew only as a fuel-systems specialist whose up-phases rarely coincided with mine. The other man, however, was my friend Thich Ngoc Bao, our mission's chief astrophysicist.

Bao sprinted up the ladder. The fuel-systems man turned toward us brushing invisible lint from his tunic. Dean, who had fixed all his attention on Bao and the ABVT's shiny ivory tube, paid him no mind.

"Whurh are we?" Dean said.

"The observatory," Lily said.

"I go up . . . *thurh!*" Dean pointed at the ABVT.

"No. Sit." I made him sit down in front of the shielded viewport. Dean burrowed into the chair and rolled his head against its cushion, his eyes hungry for new wonders. Clearly, this place excited him.

"Watch," I said.

The shields on the forward viewport retracted, exposing a window into space two meters tall and at least twice that wide. Dean quivered. Gaping, he pulled himself forward, his pudgy legs banging the chair's undercarriage, his pudgy hands bouncing on his knees.

"Holy crow," he said. "Holy crow."

Lily put a hand on his shoulder. "Happy birthday, DeBoy. Many happy returns."

"Whurh iz," straining hard to see, "New Hohm?"

"There." I nodded at the window. "Straight ahead. Among those fuzzy match flames and haloes."

Actually, between *Annie Jump* and the edge of the Epsilon Eridani orrery there now lies an arc of interstellar debris—tumbling chunks of dirt-ice, frozen gas, a chaos of nomadic mongrel rocks—not unlike the Oort Cloud beyond the orbit of Sol's Pluto. Our armada's astronomers, using radio telescopes as well as ABVTs, detected this belt less than five E-years ago. Today, we call it the Barricado Stream. Given the dimensions of this shadowy region, however, Commander Odenwald and his counterparts on *Zwicky* and *Chandrasekhar* foresee no trouble taking even our prodigious arks through its far-flung hazards into the system's heart.

The tech who'd been talking to Bao strolled over and halted in front of Dean. From this new vantage, he stared at Dean. The relentless blankness of his gaze annoyed me so much that I stared pointedly back at him.

"Hello, Mr.—?" I prompted.

"Mikol. Kazimierz Mikol. Children have no place up here."

"Sez who?" Lily said.

"Regs, I'm afraid. Ask Heraclitus." He hitched his thumb at the nearest toadstool unit. "Check for yourself."

Seeing a quick tautening of the cords under Lily's jaw, I said, "Dean's just come off a short ursidormizine nap. He's six. This is his first observatory visit. Why try to squelch his pleasure?"

Mikol shrugged.

"This is his birthday present," Lily said. "Abel wanted to give him—" She stuck.

Mikol superciliously lifted an eyebrow.

"—the stars," Lily finished in some consternation.

"Oh? Is that right? Who's Abel?"

"I am," I said. "Abel Gwiazda. When I was twelve, my adoptive father gave the stars to me for Christmas on my first Mars trip."

Mikol clasped his hands at his waist and smiled. "Ah. The reenactment of a family tableau. How sweet."

Lily and I exchanged a look.

"Of course, the reg in question has its roots in a wholly legitimate concern for mission efficiency," Mikol said. "In addition—as if it mattered in this case—it means to protect our youngest from the deleterious effects of either cosmic rays or overexcitement, I forget which."

Dean kept gaping at the stars, but I gaped at Mikol. I had never known such rudeness, even under the guise of enforcing shipboard discipline, since coming aboard *Annie Jump Cannon* off Luna in 2062. Reputedly, the U.N.'s planners had selected against egregious social blunderers like Mikol. If so, how had he contrived to get aboard?

Pointing, Dean suddenly cried, "I see . . . New Hohm!"

"No," I said. "New Home's sun, maybe. We're still too far away to make out planets."

"Or even the biggest rocks in the Barricado Stream," Mikol told Dean in a grating adult-to-child voice.

Dean twigged next to nothing of the insult. He grinned at Kazimierz Mikol.

Mikol turned to Lily. "Does the boy like rocks? Take him down to the beach garden in hydroponics."

"Abel's done that already," Lily said. "Dean likes it."

"Likes rocks, does he? Good. Maybe we'll grab one with a Colombo tether while crossing the Barricado."

"Whatever for?" Lily said.

"To abandon him on," Mikol said as a parting shot. He strode to the scaffold lift before Lily or I could blink, much less frame a rejoinder.

Dean, heedless, sat there gnomishly. Starlight, modestly color-shifted from our deceleration, washed over his face like melting diamonds.

I was outraged. I stared after Mikol, thankful only that Lily and I could give our son the stars.

Me? Just as I told Mikol, I am Abel Gwiazda. My adoptive parents came to the United States from Poland in the fourth decade of the twenty-first century. My father, a physicist trained in Krakow, and my mother, the science journalist who broke Poland's so-called "Coca-Cola/Cyclotron" scandal in the late twenties, took positions with the ISCA (International Space & Colonization Authority) in Hutchinson, Kansas. After discovering that they could have no children of their own, they adopted me, a nameless Tanzanian child orphaned in the last of the Drought Riots and smuggled to Puerto Rico by profit-taking babyleggers.

I grew up well-loved, but aimless and deracinated. I spent three years as a teenager in a dome community beneath the great escarpment of Mons Olympica on Mars, learning, more by accident than deliberate application, the agrogeology skills that, upon our joint return to Earth in 2056, I took up formally in Oran, Algeria. With doctorate in hand and recommendations from my well-placed parents, I qualified for, and easily landed a spot in, the Epsilon Eridani Expedition—whose planning, funding, and assembly in lunar orbit occupied the entire world throughout the turbulent fifties. You can't go home again, but you can try to make one Elsewhere, and for me the E's in E³ stand for that very hope.

A part of any home is family. I can't help it: I feel the call of family intensely. So strongly did I feel it before the making of my son Dean that I (respectfully) sought reproductive contracts with a half dozen women in G-Tower—including Etsuko Endo, Nita Sistrunk, and even the menopausal physicist Indira Sescharchari—before Lily Aliosi-Stark, a kindly woman in her late twenties, agreed. Her only stipulation was that I expect and solicit only minimal help from her in raising the child. To raise a child in the habitat tower of an ark, at least one parent must forgo the balm of ursidormizine slumber, submitting to the pitiless depredations of aging to care for, teach, and discipline that child.

"This is what *you* want," Lily said. "I wish to save myself for New Home. I don't want to set foot there feeling achy and antiquated. Understand?"

I did. So Dean is *my* child. I begot the Down's-syndrome boy on Lily during several bouts of fiery lovemaking. Later, in a burst of self- and partner-mocking irony that startled and then tickled me, Lily called our wild sessions a "screw-bilee." Aboard *Annie*, I have a reputation for straight-laced stoicism stemming from my Reform Catholicism and the twin concerns of my arkbound work, agrogeology and poetry. The former I do for business (ultimately, the business of survival), the latter for love—just as, looking ahead, I persuaded Lily to conceive a child and then finagled authorization from med services for her to carry it to term.

During our lovemaking, Lily said, "Boy or girl, give it your name. I decline to hang another hyphen around the poor kid's neck."

"Gwiazda-Aliosi-Stark?"

"Absolutely not. Throw in a double first name, Claude-Mark or Julia-Cerise, and it'd go down like a swimmer in a titanium wetsuit."

So, months before giving birth, Lily renounced any claim on handing the child her surname. This fact comforted me. What if she had waited until the photoamnioscan at the end of the first trimester revealed the embryo's trisomy 21? (Which, of course, it did.) At that point, the imperfect fetus would have thrown her motives forever in doubt. I would have wondered if she had deferred to me not solely out of her wish to set aside the demands of parenting, but also out of scorn for our botched offspring.

Masoud Nadeq, the chief physician in G-Tower, showed us the results of the photoamnioscan and listed our options, namely, to abort the pregnancy, to bring it to term with no effort at gene rectification, or to intervene at the chromosomal level with the highly limited procedures available on board. During the past seven E-years, nearly two hundred other children have been born on the *Annie Jump Cannon* alone, and Nadeq's records show that only one other couple cosmic rays, variable gravity, and the other gene-crippling aspects of near-light-speed travel aside—has conceived a Down's-syndrome infant.

Lily: "What did they do?"

Dr. Nadeq: "They chose to terminate."

"Is that what you advised?" I asked.

Dr. Nadeq: "For quite good reasons, expedition guidelines strongly advance that option. In cases like yours, however, there's no unappealable directive to terminate."

I said, "To get a directive, our fetus would have to have two heads or no brain. Is that it?"

Dr. Nadeq: "In a manner of speaking."

Lily: "Then our baby is reprieved."

Dr. Nadeq: "Do you agree, Dr. Gwiazda?"

I said, "Of course. Didn't I lobby this woman to help me call our hatchling's pent-up spirit from the dark?"

Dr. Nadeq: "That's . . . very poetic."

"My avocation. Didn't I run our application through every nook and switchback in Heraclitus's cybernetic innards?"

Dr. Nadeq: "Then you accept the role of guardian as well as that of sire?"

Lily: "He does."

"I do," I said.

Dr. Nadeq: "Excellent. Sign off on this waiver."

"What waiver?"

Dr. Nadeq: "Of unadulterated community support—once, that is, your child is born and later when we begin to colonize New Home."

I despised the waiver's threat of premeditated abandonment, but I signed off on it. How could I condemn a society under extreme environmental and psychological duress for declining to accept with open arms a handicapped child? Especially when Lily and I chose to bring him to term in full knowledge of his handicap and his potentially disruptive needs?

Even so, the waiver galled. I signed it with a trembling hand.

Most voyagers treat Dean with kindness. To date, this Kazimierz Mikol bastard comprises a boorish minority of one. Despite recycling and other ingenious reclamation schemes (his reasoning must go), we have finite supplies, and once we make planetfall, anyone with a mental and/or physical handicap will represent an outright drag on the colonization process.

Better that Dean had come stillborn from the womb, Mikol must figure. Better, now, that we recommit him to the darkness through an ejector tube.

I think too much on Mikol's hostility. Most people, as I have said, are kind.

Item: Etsuko Endo, a biologist who passes her up-phase time doing adjustment counseling, recently spent four hours casting sticks of different lengths for Dean and helping him lay them out in educational patterns.

"Rhommm-buhz!" he said when Etsuko brought him back to me. "Daddy, I cuhn make a . . .

rhombuhz!" So proud. Even as he made, not a rhombus, but a triangle whose unequal sides did not quite touch one another.

Item: Commander Odenwald visited Lily only two hours after Dean was born. Repeatedly since that visit, he has used small portions of his long up-phases (despite enzyme cocktails and downtime cell repairs, his hair has turned cayenne-and-silver) to watch Dean trip-sleep or to guide him around the various facilities in G-Tower. In fact, had I not begged him to leave the observatory to Lily and me, Odenwald would have long ago showed that to Dean, too. I believe, then, that with a simple request I can have Mikol dressed down, if not sent packing to his biorack.

Why bother? If Dean had understood any part of Mikol's insult in the observatory, or read the least shade of disdain in his face, I would do it. But Dean thinks everyone loves him. In a universe of swallowing dark, and despite the eclipse of his reason at conception, he scatters a property so similar to light that it dims my vision.

Until, less than a decade ago, a few of us began to have children, you could seldom find more than twenty people awake at any one time in any single living tower on the ever-clocking wheels of our ships. Ten percent of the expedition's personnel oversaw the armada's running, tracked the stars, maintained ship-to-ship communications, studied their specialties like workaholic monks, and ministered to the quasi-corpses stacked in each ark's bioracks.

Only a few days into these up-phases, loneliness settled. An ineffable strangeness pervaded *Annie's* labs and corridors, as if a winged fairy tripping along at light-speed had cast a spell over my sleeping arkmates, a dark enchantment over every workroom, crawlspace, and maintenance deck. I could hear this implacable sorcery in the hydrogen hiss of the stars; in the white noise of generators, computer-cooling fans, and hidden air recirculators.

I came aboard U.N.S. *Annie Jump Cannon* as a hotshot Ph.D. of twenty-two. So far, this voyage to Epsilon E has taken a little over 109 standard years—relative, that is, to the arks in our fleet. Had I left an infant child with my parents in Algeria, it would have long since doddered into codgerhood—if it remained alive at all.

As for me, given the periodic metabolic respite of U-sleep, I have aged (Dr. Nadeq tells me) the physiological equivalent of only thirteen years. In short, I am a thirty-five-year-old centenarian. But no one stays up-phase much longer than a month each shipboard year (other than Commanders Odenwald, Roosenno, and Joplin, and a few engineering troubleshooters and continuity personnel), so that, among us would-be colonists, youthful centenarians—of many different ages—register as commonplaces, not freaks.

Of course, in this final decade of our approach to Epsilon Eridani, an expedition policy authorizing the conception, *in utero* gestation, and natural birth of children took effect for screened personnel young enough to carry out their parental obligations on New Home. Six years after Lily and I made Dean, this policy lapsed because "children under four will impact negatively on the efficient settlement of the target world that we have hopefully denominated New Home."

Then why permit the arrival of any children at all? Or, at least, the arrival of any offspring under the able-bodied age of, say, sixteen?

Well, the original U.N. planners believed that "in the long term, a generation of colonists reared on the target world's surface from midchildhood, adapting daily to that world, will prove of incalculable benefit to the planting of a permanent human base in an alien solar system." Nobody, of course, had factored

Dean into this reckoning.

In any case, with the advent of children, the living towers on our three wheelships seem less like mausoleums and more like chatter-filled atria or aviaries. I have stayed continuously up-phase ever since Dean's birth (Lily, by contrast, opted for ursidormizine slumber soon afterward and comes up-phase only on his birthday). Although Dean takes closely monitored "naps"—to foster cell growth, to husband our various dry-good stores, and to ease the burden on our recirculating systems—I have no desire to down-phase just to match my sleep periods to his. I sleep when I need to, without drugs, and plot ways to sample, test, and seed the unearthly (conjectural) loams, marls, and humuses of New Home.

At other times, of course, I work in G-Tower's polyped, where Dean has become a cherished favorite of his playmates; a mascot, almost. His blockish head, flat nose, spongy tongue, and stubby hands endear him to, rather than estrange him from, the group. The curiosity and altruism of well-loved children has a weird dynamic. It astonishes and uplifts. It soothes. So how can I regret the nearly six extra years that I've aged as a result of going up-phase for Dean?

Simple: I can't.

Meanwhile, the metaphoric seedpods of *Annie's* towers have begun to rattle and split. Our corridors ring. The children dance, wonder, explore, scuffle, and sing. Kazimierz Mikol, I feel sure, has taken both a powder and a double dose of refined and amplified bear's blood: ursidormizine.

Our G-Tower mess is draped festively about with acetane banners. Through it drifted a smell like fried ozone and the piped-in strains of an old song called, if repetition of a single phrase means anything, "I'm So Dizzy."

Thich Ngoc Bao, the astrophotographer Nita Sistrunk, and I sat at a table over our trays. Dean huddled in an obsolescent VidPed near the door, spinning the control ball with his palm. (He won't use virch goggles; their simulated environments cut him off too thoroughly from me, and that scares him.) Hiller Nevels, a pilot and maintenance tech, swaggered over from the autodispenser to join us.

". . . detected Eppie's heliopause," Bao was saying. "So we *will* in fact rendezvous with the system."

"You doubted we would?" Nita said.

"Eppie's heliopause?" Hiller said. "What's that?"

"Did *you* never doubt, Nita?" Bao took a bite out of his steaming oystershell pasta and its garlic-spinach filling. He swallowed. "One down-phase, I had a six-month-long nightmare, complete with sound and motion effects. *Annie* dropped like a stale doughnut into a Kerr singularity and whirled around its glowing mouth for about twelve eternities. Frame-dragging, you know. I mummified in my biorack. So did everybody else."

"Cheerful talk," Hiller said.

"Eppie's heliopause is the very edge of the Epsilon Eridani system," Nita told Hiller. "Where the star's solar wind hits the charged particles in interstellar vacuum."

"Isn't the Barricado Stream the edge?" Hiller said.

A star's energy influence, Bao explained, extends well beyond its farthest planet or cometary cloud. Low-frequency radio emissions can undulate a dozen billion miles into the obsidian emptiness surrounding a star.

As Bao spoke, I watched Dean swaying in the VidPed, slapping the control ball. I could see his virtual self—a chunky two-dimensional figure with a feathered spear—stalking a herd of electronic ostriches on a veldt whose real-world equivalent long ago turned into tourist hotels, tennis courts, and golf courses.

Dean didn't care about that. The control ball was easy to spin; the figures on the screen made him laugh. His chuckle, along with the way his head lurched gleefully, wanned my heart, almost as if Lily had rubbed my chest with some sort of thermotherapeutic cream.

Without alerting the others, I picked a comppad off my tunic's carrypatch and began to punch out some verses. I struggled, recasting each stanza three or four times before moving on. During this effort, *Annie* and my friends ceased to exist for me.

In the end, I had my entire effort almost, if not quite, the way I wanted it:

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I looked up to find my friends eyeing me with amusement. How long had I occupied myself writing my poem? Even Hiller, the last of us to sit down, had polished off his meal and was staring at my comppad.

"Another poem?" Bao said. "Well, you have to let us see it. If it's bad manners to tell secrets in front of one's dinner companions, concealing a poem composed at table is also rude. Surely."

"The rudeness is writing it in front of us," Nita said. "He might as well've sat here picking his nose."

Hiller guffawed. "That depends on the poem. Or the nose."

Bao reached across the table. "Give."

I handed him the comppad. I had no qualms about showing around the product of my creative withdrawal. Keats need not fear even a partial eclipse of his immortality, but no other soul this far from home—with the self-proclaimed exception of the Pakistani sferics specialist Ghulam Sharif on U.N.S. *Fritz Zwicky*—can rival my versifying prowess. Other expedition members may scribble confessional, or hortatory, or occasional poems (if you look, you can find the results of their activity on toadstool units everywhere about), but I (humorously) regard my challengers as amateurs or hacks.

"Prepare to fall at my feet in veneration."

"Gripes," said Nita. "Self-praise is no praise at all."

"I unequivocally agree, Ms. Sistrunk," I said.

"You do?"

"Sure. But *no praise* is also no praise at all. I blow my own horn to add a little dressing to the silence."

Bao began to scroll the comppad. He read each stanza aloud for the others. He did so with a pitch of feeling that humbled me: I could *hear* the hiccups in my poem's flow, the off-speed diction, the bungled metrics—hiccups for which Bao's sensitive reading almost compensated.

"What's an eggling?" Hiller asked.

"A little egg," Nita ventured. "What else?"

I said, "I don't know. Something hard like a stone, dense like a black hole, and life-packed, potentially, like an ovum. See? Eggling."

"What does it mean?" Hiller asked. "Not just eggling, the whole poem?"

"That he loves his son," Bao said. "And looks forward to raising him to manhood on a brave new world."

I could add nothing to that, and when Bao gave me back my comppad, Nita began talking about heliopause again, the savory imminence of planetfall.

Our fleet pulses onward, skimming at a modest moiety of light-speed the interpenetrating membranes of space-time. The Barricado Stream—inside the hard-to-mark heliopause, outside the orbit of a planetary iceball—rushes nearer.

Toward the end of the twentieth century, perturbations in Epsilon Eridani's motion revealed that it most likely dragged planets, if not a gravity sink, around it. Observations made from the Infrared Lunar Astronomical Telescope (IRLAT) on Darkside in the 2030s, along with the fact that Eppie emits an infrared signal hinting at protoplanetary debris, led scientists to posit that the system had five planets, including one in Eppie's zone of habitability, and possibly an outer dust band. We sent out an unmanned probe to confirm these hypotheses, but our armada—dispatched nearly thirty years later, when Ju Tong technology, multinational money, and worsening environmental/social conditions converged to make the launch seem practical if not imperative—has long since outrun the U.N. probe.

Fortunately, shipboard telescopes and Thich Ngoc Bao's relativistic calculus have validated the presence of these worlds. Even more convincingly, so has a probe that we dropped over the side of *Zwicky* before commencing deceleration; as our arks slowed, this probe kept going, making a full-speed transit of the system and thereby detecting the cometary matter in the Barricado Stream by radar echoes.

In any case, New Home does exist, along with a fiery inner planet that a wag among us tagged Red Hot. Three outer planets received equally silly names: Jelly Belly, Jawbreaker, and Cold Cock. Moreover, spectroanalysis carried out on *Chandrasekhar* indicates that New Home has water.

A couple of days ago, because Dean requires extra work and attention if I wish him to reach his full potential, I took him into the geology bay under *Annie's* observatory deck. I planned not only to do some elementary professional review but also to show him a grabbag of tray specimens: a quartz crystal, a piece of obsidian, a leaf of limestone, a fossil imprint, a geode. Estsuko Endo, after all, has too much to do to spend her every waking moment amusing Dean or devising therapeutic games to educate him.

I don't. My real work begins when our advance scientific teams set down on Epsilon Eridani II (even the hackneyed New Home seems a better name than that) to map, explore, sample, test, and catalogue. Besides, I'm Dean's father: I insisted that this expedition permit him to be.

Dean handled each specimen with clumsy delight. Except for the collection's lone geode, the specimens are small to the point of parody. In fact, many soil and mineral types exist on *Annie* only as wafer-thin cross sections on glass slides for microscope viewing.

I half feared that Dean would slice himself on the crystal. (His fingers have the nimbleness of porcelain.) Or would drop the trilobite fragilely preserved in Ordovician clay. Or would lose the stalagmite tip that rested on his single-creased palm like a Lilliputian dagger.

But, chortling, goggle-eyed, Dean managed to hold on to, examine, and return to me every item. He was as respectful of them as, on his sixth birthday, he'd been of the glittery stars in the observatory's viewport.

"Whuh's thiz?"

"Schist."

"Durdy word?"

"No. *Schist*. A flaky, stress-formed rock. Be careful, you'll peel away a mica layer."

"Sch-schid?"

I started to say, "No, *schist*," when I heard a man behind us laughing, just inside the bay's entrance. I looked over my shoulder to see (for the first time since Dean's visit to the observatory) Kazimierz Mikol.

My gut clenched, a spasm of *déjà vu*. What was Mikol doing in a work-and-study laboratory

authorized for, if not expressly limited to, *Annie's* geology contingent? Would he argue that my six-year-old retardate had no business here? No business, for that matter, anywhere?

"He *does* like rocks, doesn't he?" Mikol said.

That remark instantly soured the look I turned on him. "My sweet Jesus," I murmured.

"You mistake me for someone else," Mikol said. "Look. I came up here at Ms. Endo's request. She wanted me to tell a man in here—identity then unknown to me—that his son—ditto—would have a therapy session with her tomorrow at ten-hundred hours."

"Why didn't she intercom?"

"A whole tribe of ankle biters had her occupied. Besides, your sanctorum was on my way. I need to eyeball the harp strings sweeping down from the arc opposite G-Tower. That all right with you?"

Harp strings meant fuel spokes. I stared hard at Mikol.

"Consider yourself duly messaged, Dr.—?"

"Gwiazda."

"As you like." He pivoted on his heel.

"Wade," Dean said. He meant *wait*, and Mikol turned back to face him.

Dean held up the geode in our collection. He tilted this queer, split rock so that Mikol had to look directly into its crystal-laced cavity. Its hollow glittered like an in-fallen spiderweb in a splash of sunlight, and Mikol stared into it as if hypnotized.

"Spokes," Dean said. "Fyool spokes."

Those words seemed to stun Mikol. He looked from the reflective cavity of the geode to the dull, flat face of the boy that Lily and I, in his view, had selfishly inflicted on the limited resources of our ark.

"He means the crystals," I said. "They must remind him of the spokes to our matter-antimatter rocket."

"I *know* what he meant."

"He saw those spokes only once," I insisted. "The same day Lily and I gave him the stars."

"There's a mobile of the *Annie* in the polyped. He's seen that dozens of times, surely."

"Its spokes don't glow like the real ones. In the glare of the exhaust stream, the real ones are . . . magical."

"That doesn't make his *equating* the two a wonderwork."

Mikol refused to look away from me. And, out of atavistic machismo or scientific curiosity, I refused to look away from him. "But he's just linked you, a fuel-systems specialist, to the 'spokes' in the geode."

"He has ears. He heard me say fuel spokes. So he has a bare-assed modicum of motherwit. Hallelujah."

"What about the associative leap he just made? Not, by the way, from your words to you, but from the geode's crystals to *Annie's* weblike fuel lines?"

Dean kept pointing the geode. The way he was gripping it, it reminded me of some sort of exotic weapon. I imagined a burst of energy flashing from it and splitting Mikol's chest cavity open, to reveal . . . what? The gemlike perdurability of his heart? The flowing rubies of his blood? The hard-edged latticework of his myocardia?

"Do you think that on that basis I should declare the kid a genius?" he asked me.

"Human would do. Just human."

"Tiglathpileser was human, it's rumored. And Caligula. So were a whole host of twentieth-century tyrants. So presumably were the brain-dead idiots who turned the Earth into a treeless detention camp. Being human, I'm afraid, doesn't automatically confer demigod status on anyone."

"Human beings made these arks."

"Praise Noah for that irrefutable insight! Which onboard system did your genius offspring invent?"

This retort shut my mouth; it also had a spirit-dampening effect on Dean. He lowered the geode and made a queer, gargling moan in his throat.

No longer in the geode's sights, Mikol backed out of the workroom. I followed him.

In the corridor, Mikol pointed a finger at me to hold me at bay. "Two run-ins with Gwiazda and his hairless baboon," he said. "Well, this second run-in was a lot less amusing than the first. A third meeting may result in the total overthrow of my antihostility training, the blanket neutralization of my daily serenotil boosters."

"What's the matter with you, anyway?"

"Nothing. I dislike mongoloids. In my view, an entirely rational prejudice."

"You've overstepped yourself there," I said.

"Well, so what? I'll go down-phase again after solving my hydrogen-flow problem. And stay zonked until *Annie* enters the Barricado Stream. With any luck, I won't collide with Gwiazda and Son ever again, either aboard this ark or down on New Home, where I plan to homestead a small farm off limits to fat little mongoloids and their selfish Sambo daddies."

"You bastard," I said.

"Check out the little bastard in your lab," Mikol replied. "More than likely, he's accidentally swallowed a rock."

Once again, he strode away before I could seize his arm or mount a reply. Under my breath, though, I murmured, "Honky," not knowing where the word had come from; even so, it seemed a crass betrayal of the Gwiazdas, who, in innocence and love, had bought my life and raised me.

"Whurh's Lily?" Dean asked.

"You know as well as I. Asleep. She's always asleep. It's her calling."

"I want to see her."

"Uh-uh. You only think you do. We've done this before, Dean. The damned bioracks spook you."

"I *want* to see her," Dean said, struggling to enunciate.

"No you don't."

"Yez. Yez I do. Take me to see her."

Dean and I had long since retired to our mezzanine-level quarters. The hour was nearly midnight (as if you could not legitimately say the same of any hour of our arkboard journey), and I wanted Dean to go as soundly asleep as his mother. But an afternoon birthday party in the polyped, and then an evening of restored and colorized *Our Gang* comedies over our link to Heraclitus's vidfiles, had left him wrought up and obstinate. I could tell that an all-out battle now would snap my brittle self-control faster than would appeasement, even with a visit to the bioracks thrown in as Dean's unwarranted spoils.

(Spoils. Evocative word.)

Actually, Dean seldom tries to stand his ground against me or anyone else. Agreeableness and conciliation define him the way stealth and curiosity define a cat. Better for harmony's sake, I rationalized, to indulge him tonight in this unusual display of resoluteness than to shatter my peace of mind—what peace of mind?—by playing the tyrant.

Ten minutes after midnight, then, we dropped to the lowest level in G-Tower, a fluorescent dungeon of computer monitors and foam-lined ursidormizine pods, and asked the security tech Greta Agostos to pass us through the barred entrance of *Annie's* hibernaculum.

"On what business?" Greta asked.

"Guess. Dean wants to see his mother."

Greta rubbed her knuckles furiously—but not hard—over Dean's head. "She won't be very talkative, DeBoy. And you and your dad will have to submit to a search. You know, a ticklish patting down."

"The only reason I came," I said.

But that "patting down" remark was a standard security-tech joke. In fact, without even touching us, Greta ran an aural fod—*foreign-object detector*—around our entire bodies with the impersonal deftness the very opposite of sensual. Her fod, by the way, absolved us of trying to smuggle into the hibernaculum any sort of weapon, drug, or softdrink IV-drip.

The security bars retracted upward, and Dean and I passed into the eerie twilight mausoleum of the bioracks. The air in this circular hibernaculum has a wintry blue tinge and a biting regulated chill. You can identify our quasi-corpses, by the way, either by reading their nameplates or by looking through the pods' frost-traced visors.

We walked the hibernaculum's perimeter—tap-tap-tapping on its naked metal floor—until we had reached the biorack of Lily Aliosi-Stark. Her pod rests on the chamber's third strata, not quite two meters up, and I always have to lift Dean so that he can gaze through the rime-crazed faceplate at his mother's pale but lovely profile.

"Sleebin beauty," Dean whispered, full of awe. "My mama's jes like sleebin beauty."

"I'd wake her with a kiss, DeBoy, but my lips always freeze to the visor."

"Funny."

"Not if it happens to you. All right if we go home now?"

Dean put his fingertips to Lily's faceplate. He chuckled when they didn't stick to it. Instead, they left milky prints, which faded slowly once he'd drawn his hand away.

"Pood me down."

I put Dean down. He ambled along the bottom two strata of bioracks, back toward the hibernaculum's entrance, until he came to an empty pod featuring this legend on its nameplate: *Abel Walter Gwiazda*. Dean rubbed the letters of our surname with a stubby forefinger. Then, as I had feared—as I'd *known* would happen—Dean gulped raspily at the chilly air and went as pop-eyed as a strangler's victim. Why had I supposed that this visit would turn out better than all the others?

"Gone," Dean said. "Holy crow, daddy's gone."

"I'm right here, son. Unlike your ever-drowsing mama, you can't expect me to be two places at once."

On the verge of blubbing, Dean repeated, "Gone," at least a dozen times and then began to wail: a fractured banshee keening that filled this weird crypt for the living like a squadron of angry wasps.

I clutched my shoulders, then covered my ears, then grabbed my shoulders again. Dean's wail stung and restung the snarled thread-ends of my untangling nerves.

"*Damn you, you little defective! Shut up!*"

Dean's eyes dilated to their utmost. He stopped wailing and retreated. Repeatedly, I shoved him in the chest with my knuckles, herding him toward the mausoleum's exit. On my fifth or sixth such shove, Dean stumbled and collapsed sliding on his bottom. I immediately yanked him up.

"The one place you can't endure for three minutes straight is the one place you insist on coming! Why? You don't have a half-wit's glimmering, do you?"

Greta appeared at Dean's back out of the cold indigo fog. She knelt and hugged him from behind. He, in turn, spun about and clung to her as if to the winged savior in a fairy tale unwinding on a private channel in his head. The sight of his fear—the realization of it—staggered me.

"You asked Lily for this, Abel," Greta said. "You asked for just what's got you so hugely browned off tonight."

"I, I didn't know," I managed. "Not really."

"I'm taking Dean out front with me. He'll be okay. Go to Lily. Talk to her. Stay for as long as it takes."

Greta picked up Dean and carried him, totally compliant in her arms, around the hibernaculum's circular walk. As I stood there in the shame of Greta's rebuke, the two of them receded into the thickening blue fog.

I returned to Lily's biorack. Our conversation touched on many things, including the essential loneliness of starfaring. Later, back at the U-dorm's entrance, Dean greeted me as if I had never derided his mother or cravenly abused him—as if, in short, I *deserved* his regard.

Each of our ships carries around sixteen hundred people, two hundred to a habitation tower. Most travel

down-phase in banks of computer-monitored bioracks. Over the last few years of our approach, however, with a deliberate effort to bring children into our spacefaring community, we've increased our numbers by almost twenty young persons a tower. I assume that *Zwicky* and *Chandrasekhar* boast comparable population surges, but I've made no real effort to stay abreast of their figures. Dean claims most of my time.

After my ugly flare-up in the hibernaculum, I determined to teach Dean everything I could about our ship, our fleet, our aims, our mystical hopes. He now understands that hydrogen flows from the fuel tanks on *Annie's* thirty-mile-long wheel to the stores of antihydrogen ice in the rocket dragging us along behind it like a colossal, fixed, empty-bottomed parachute. He knows that once we reach New Home, we will have exhausted every scintilla of fuel available to us, and he also understands, I believe, that to return to Earth or to go on to another solar system (Tau Ceti, say, or Sirius) will require the processing and loading of a volume of hydrogen and antihydrogen ice equal to that with which we left the Moon. He knows. . . .

But I delude myself: Dean has profound physical and mental handicaps; and love, the ultimate paternal blessing and folly, has limited power to add to his brain cells or to pack those he has with liberating knowledge.

In the polyped portion of the G-Tower nursery, Dean and I sat behind a partition draped with a banner depicting the galactic cluster including our own Milky Way. I thumb-moused a gyroscopically interphased replica of *Annie Jump Cannon*, hung above us as a mobile, through a dozen different maneuvers. In its nearly invisible filament harness, the tiny ark canted, wheeled, and strained.

Dean was weary of the drills and demonstrations, enduring them out of a puppy-dog loyalty. In fact, I felt that somewhere along the trajectory of this lesson, our roles—of father and son; of mentor and student—had reversed.

"Howfurh?" Dean said.

"What?"

"How furh to New Hohm?"

"I don't know. We're still braking. Commander Odenwald probably has it computed to the nanosecond."

Etsuko came in and sat down opposite Dean in a kiddie chair almost too small even for her. "No matter when we get into orbit around New Home," she told Dean, "you'll probably be at least eight or nine before you visit the planet."

Dean visibly perked—not at Etsuko's words, but at her presence. "Why?" he asked.

"We'll have a lot to do before we let any of you children risk the surface. Surveillance, photography, mapping, testing, a great many things. Understand?"

"Are thurh guhna be monstuhrs?"

"Monsters?"

The wedge of Dean's tongue hung between his lips. Then he said, "*Dyne-o-sours*," as if the word embodied a vinegary type of lizardly force.

"I doubt that," Etsuko said.

"Then whud? Peepul?"

"I doubt that too."

"And if there were people, intelligent beings, they'd look upon *us* as the monsters," I said. "Invaders from outer space, their worst fork-legged nightmares."

Dean's face clouded. His tongue filled his mouth like a gag.

"Abel, you've scared him."

"No great task." I usually avoid sarcasm—my son has no feel for it—but I hadn't slept for over fifty hours (not even a catnap), and Dean's intractable innocence had worn some holes in my thick-skinned cheerfulness. "But suppose, Etsuko, that we do drop down to New Home and find ourselves confronted by a species of gentle sapients."

"Suppose we do?"

I told her how the aboriginal sapients of New Home would inevitably view us as a scourge. Later, I wrote,

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Still later, Dean occupied elsewhere, I showed this effort to Etsuko. She read my last little quatrain as an insult.

Without benefit of ursidormizine, I dream of New Home and its dominant species: humanoid creatures unaware that invaders from outer space are eyeing their world. A landing in the capital of their foremost nation-state allows the first U.N. party down (oddly, it includes both me and Kazimierz Mikol) to see that every individual of this species roughly resembles my handicapped son.

"I know what we ought to call this place," Mikol tells me: "Special Olympica."

In a collective journey of a century or more, you cannot expect to reach your destination without losing someone, even if the majority of your expeditionary force spends most of its time in monitored trip-sleep. Seven of *Annie Jump*'s original contingent of sixteen hundred have died in transit, the latest (but one) a woman in A-Tower who failed to survive childbirth, although, blessedly, her infant daughter did not die and still lives in the A-Tower nursery.

Arkboard funerals last only minutes; few among us attend them. Each tower has a chaplain well-versed in the rituals of different faiths, those of mainline world religions as well as those of small local cults. If the deceased ascribed to a particular belief system and left unambiguous instructions, the chaplain observes them during the memorial service and the subsequent ejection of the corpse from the ship. (For reasons that should be self-evident, our regs permit neither cremation nor entombment.)

Granted, most of those who have died, both here and on our sibling arks, have professed a generic sort of agnosticism or a science-centered, mystical atheism (no matter how oxymoronish this last term may sound), but one man aboard *Chandrasekhar* asked for and received a voodoo funeral, complete with chants and sprinklings of (symbolic) rooster's blood. According to associates, he believed that one day, far in this expansion/contraction cycle of our cosmos, another starfaring ship would retrieve his mummified corpse. Technospiritually revived, he would walk its decks as the undead prophet of the universe's next systalic blossoming.

In my view, the shame of this bravura credo resides not in its superstition, but in the fact that only four of this man's arkmates attended his obsequies. Of course, those who sleep cannot send off the sleeper.

The point of this digression? Several weeks after taking Dean to visit his sleeping mother, a woman by the name of Helena Brodkorb, a floral geneticist in D-Tower, died in her biorack. Despite a complex fail-safe system, her monitors had not alerted her tower's med-unit personnel of her measurable physical deterioration under ursidormizine. By the time anyone noticed, she had slipped away.

A small scandal ensued. Odenwald suspended two up-phase med techs and ordered an investigation. He did not intend to have one more sleeper under his command die in a malfunctioning biorack.

This death would have meant little to me, and nothing to Dean, if, a few hours later, I had not learned that Helena Brodkorb was—or had been—Kazimierz Mikol's aunt, an aunt two years younger than he. Further, Ms. Brodkorb had no other kin on *Annie* or our sibling arks. (Effecting a passenger exchange between two huge wheelships moving at point-ten *c* is a doable but risky venture.) Excepting spouses and the children born during our decade-long approach to Epsilon Eridani, few people in our expedition have relatives aboard our arks. Therefore, Odenwald felt that Mikol, down-phase again in G-Tower, should know that Ms. Brodkorb had died, even if—maybe *especially* if—it reflected badly on arkboard

fail-safe systems. Mikol might elect to attend her last rites.

Quickly, then, Mikol was up-phased, and Odenwald personally broke the news of his aunt's demise.

Mikol, groggy from both the ursidormizine and its sudden neutralization, began to weep. (I have this fact from the med techs who revived him.) He had loved Helena Brodkorb. The disorientation common to the newly awakened may have influenced him, but, still, Mikol's tears had a strong emotional, not just a narrow physiological, wellspring.

I had difficulty crediting this report, of course, but it cheered rather than surprised me. I wanted to believe it—not that a smart and productive woman had died, but that Mikol had reacted to her passing less like an automaton programmed for cynical efficiency than like . . . well, someone's warm-blooded nephew.

I have reconstructed Kazimierz Mikol's activities on the day before Helena Brodkorb's memorial service from an account he gave me later. The most surprising things about this turn of events, of course, are that he deliberately sought Dean and me out in a spirit of reconciliation and that he and I did in fact reach a wary accord.

On that morning, then, Mikol dressed in paper coveralls and a pair of plastic slippers. He added a disposable dove-gray tunic. Every item in his make-do wardrobe emitted a soft gray incandescence. Dove gray. Mourning-dove gray. The colors of civilized dolor, gentlemanly grief.

The chaplain in D-Tower had scheduled Helena's funeral for 0900 hours the next day—after a noninvasive autopsy and med-tech analysis. Mikol had received assurances that he would be unable to tell that anyone, or anything, had so much as pinched Helena's eyelid back or calipered her elbow. He would find her lying serenely in state on the retractable lingula, or tongue, of a waste-disposal ejector.

Tomorrow.

In the meantime, Mikol had a small mission to carry out. He tried to recall what amusements—games, toys, icons—young boys found amusing, and which still pleased *him*, as an adult. No rocks, though. No fake beaches in hydroponics. No shiny precious or semiprecious stones. No geode. Nothing, in fact, pertaining to geology, the professional realm of Dean Gwiazda's father.

Mikol thought a long time. Then he took a lift from the transphase lounge to the mezzanine-level cubbyhole of a pilot and maintenance tech. This, not altogether coincidentally, was a pack rat named Hiller Nevels. Hiller gave him the items he wanted as a kind of consolation gift.

Gift in hand, Mikol rode back down and crossed the G-Tower atrium, a lofty cylinder housing vitrofoam benches, a vegetable garden, exotic ferns, parrot-colored orchids and bromeliads, and a regulated population of purple finches. Heedless of its plants and birds, Mikol hiked through this pocket wilderness to the catwalk outside the polyped.

He found Dean and me playing a game of cards (Go Fish, if I remember correctly) at a toadstool unit well removed from the other children. I greeted him with a look betraying my outrage and suspicion:

"Yes?"

"I came"—Mikol told me later that he could feel his words scratching his throat like a rusty sword blade—"I came to make peace."

"Why?" I said.

"You need a reason?"

"If I'm not to regard this as a shabby trick, yes."

"Such generosity of spirit."

The cards on Dean's screen fanned out before him like so many canceled tickets, and he gave Mikol a toothy, distracted smile.

"Dr. Gwiazda, the truth is, I've undergone a—"

"A change of heart?"

"Perhaps."

"Because your aunt has just died?"

"Word certainly travels."

"Yes, it does. At a healthy fraction of light-speed."

Dean pushed away from his toadstool console. "*Hullo!*" he cried. "*Mistuh Mickle!*"

Mikol knelt beside Dean and pulled a small, foam-lined carrypress from his pocket. After thumbnailing its lid open, he held it on his palm so Dean could see the faceted seeds inside it. They looked like four pieces of sparkly gravel. This was a coincidence of appearances, though, not a surrender to the insult theme—*rocks in the head, out on a rock*—that had so far typified his run-ins with Dean and me.

"Whud . . . whud are they?"

"Eye-eyes," Mikol said. "Impact inflatables."

"They're so . . . liddle."

"The better to bring aboard a vessel where closet space is tight. Touch one."

"No!" I said. "Mr. Mikol, those things are illegal aboard *Annie*."

"Not so," Mikol said from his crouch. "Would I endanger our ship? Or hooliganize your son? You see, *these* eye-eyes will fall back to portable grit as quickly as they burst to their full dimensions—the latest in amusement engineering just before our launch."

Dean held a finger over the carrypress: expectant, unsure, ready for direction. His psychic investment in electronic Go Fish had long since bottomed out.

"No," I told him.

"Ease off, Dr. Gwiazda," Mikol said. "I'm trying to make amends, not get the boy bioracked for reckless mischief."

Although still skeptical, I thought this over and nodded at Dean. "Go on, then. Take one. Just one."

Dean's hand trembled over the carrypress. Mikol seized it and guided his forefinger to one of the eye-eyes. Sweat and surface tension lifted the eye-eye clear. Dean stared at the grit on his fingertip in what looked to me like goggle-eyed dumbfoundment.

"Roll it between your thumb and forefinger," Mikol said. "Then throw it against the floor or the wall." He stepped aside to give Dean room.

Dean flicked the eye-eye feebly past my head. It struck the polyped's deck, skittered to a standstill, and began to emit a faint, melodious hiss.

When Mikol picked it up, it quieted. "More *oomph!*" he advised. "Try again." He gave the eye-eye back to Dean, who looked to me for guidance.

"Go ahead. Hurl it. Hard."

Dean obeyed, tossing the eye-eye with such an awkward shoulder snap that I could imagine him whining for weeks about the lingering soreness. A hard expulsion of breath through his nostrils sounded a lot like a squeal.

But the eye-eye hit the wall behind me and impact-inflated on the rebound.

Wham! Revolving in the polyped was a fabriloon replica of an Allosaurus as large as Kazimierz Mikol himself. It hissed as it tumbled, that crimson and turquoise effigy of a giant lizard, and hissed more loudly than the eye-eye from which it had burst. At length, it righted and settled on its hind legs to the deck.

Dean had begun to scream.

Mikol might have guessed that a dinosaur exploding into view would traumatize a child of Dean's makeup, but, of course, he hadn't. He grabbed the effigy and thrust it to one side—as if removing it a few centimeters would calm Dean. It didn't. Dean went on wailing, his hands at chest height in fortuitous parody of the Allosaurus's forepaws.

"It's all right, Dean," Mikol was saying. "Look. It's okay. A make-believe lizard. See. A plaything."

Despite the threat of ear damage, I picked Dean up.

Meanwhile, Etsuko Endo, Thorn Koon, and Sidonia Montoya came rushing in to us from the main polyped. A covey of children in bright paper tunics, muu-muus, dhotis, or jumpsuits crowded in behind the adults to satisfy their own curiosity. One little girl patted Dean's rump and said, "Shhh, shhh," as I also tried to shush him, but the others either flocked to the dinosaur or clamped their palms over their ears.

"Holy crow!" Dean screamed. "*Mon-stuhrrr!*"

"He could mean you," I told Kazimierz Mikol.

Mikol moved one hand in a rapid back-and-forth arc to keep the kids from the fabriloon. "I'm sorry, Gwiazda. You can't think I wanted *this*. I figured the instant manifestation of a dinosaur would, well, tickle him." He slapped the knuckles of Danny Chung-Barnett, who had weaseled far enough into the corner to grab the effigy's turquoise scrotum.

"Can't you de-pop it?" Etsuko asked over Dean's spookily modulating wail.

"Of course. See this." Mikol pointed to a navy-blue spot behind the fabriloon's left eye. "Watch."

He jabbed the spot. With a flatulent keen, the Allosaurus collapsed, rekernelized itself, and began to hiss—so that we could find it again. Mikol grabbed up the tiny eye-eye before the Chung-Barnett kid could pounce on and flee with it.

Dean stopped wailing. Chagrined, Mikol told Etsuko, Thorn, and Sidonia what had happened.

Herding children before them, they went back to the polyped's main activity area, leaving Mikol to struggle with the necessity of apologizing to Dean. To his credit, Mikol apologized.

Insofar as I had perceived him as an enemy, in the next few moments Kazimierz Mikol ceased to exist. The cynic who had viewed my son as a deadly obstacle to our colonizing mission to Epsilon Eridani vanished as suddenly as had the eye-eye dinosaur, leaving behind no speck of grit to flash-reconstitute his hostile persona.

"If carnivorous lizards are out," he said, "what *would* make a good present for Dean?"

"Stars," I said. "Try stars."

After the debacle in the polyped, Mikol actually resolved to do as I had suggested. He would bestow upon Dean a gift of stars—not by escorting him to an observatory viewport, but instead by allowing Dean to accompany him to Helena Brodkorb's last rites in D-Tower. This trip, over a fifteen-mile arc of the top side of *Annie's* wheel, would take a good half hour and expose Dean to all the stars salted into the engulfing bowl of space. Seen from the bubbletop on our perimeter car, these stars would prickle, blaze, shimmer, dim, and flare out again: an unceasing festival of light. Dean would watch it all as if bewitched.

"I don't know," I said. "A ride in a perimeter car may terrify him as much as—"

"A fabriloon from the late Cretaceous?"

"Exactly."

"He's had a good look at stars before. You and his mother made sure of that on his birthday."

"But he's never set foot outside G-Tower."

Mikol appealed to Dean. "You don't want to spend the rest of your life in G-Tower. When we go into parking orbit around New Home, you don't plan to nest in the polyped while everybody else is down exploring the planet. Do you?"

"No surh." Puzzlement and hurt clouded Dean's face. "Nod if . . . I doan huvh to."

"Good for you. So. Would you like to go for a little ride in Peeter?"

Peeter was the name I'd given the perimeter car officially allotted to Towers G-H. Take *rim* from *perimeter*, and you have our magnetic conveyance's pet monicker. It's a silly sort of joke. We call *Annie's* other three perimeter cars Pauli, MARE (Magnetic Arc-Ranging Elevated), and Albertina. In any case, Mikol spoke the name Peeter on purpose—to flatter me?—even though, as he later confessed, he could not decide if it were genuinely clever or only unbearably cute.

"Yez," Dean said. "I wuhd like to ride."

"But he doesn't want to attend the funeral," I said. "Just the sight of sleepers in bioracks—"

"Then he doesn't have to," Mikol cut in. "He can go to the polyped and virch with the other ankle biters."

"Then I'll ride along too."

"Master Gwiazda, do you want your silver-tongued old man to go over to D-Tower with us?"

Solemnly, Dean nodded.

"Then it's settled," Mikol said. "To give ourselves plenty of time, we'll leave at 0750 hours."

Peeter, our magnetic bubbletop, tracked along the front top edge of *Annie Jump's* breathtaking wheel of underslung hydrogen tanks. From our perches in the car, we could see *Fritz Zwicky* running parallel to us, a ring of diamonds twinkling beyond the silver Mobius strip of our own ark. *Subrahmanyan Chandrasekhar* was an opalescent sheen somewhere off to port. The other two arks were dimly visible to us, of course, only because of their running lights and the mirrored glow from the exhausts of their braking rockets.

Three distinct motions had their common vectors in our rim car: the bubbletop's tortoiselike crawl toward D-Tower, the gravity-producing circumvolution of *Annie's* fuel ring, and the starward progress of our ark at point-ten *c*. It seemed to me that these countervailing forces should have ripped us from limb to limb, that our brains and entrails should have flown outward like loose meat in a centrifuge. Instead, we journeyed without incident, three casual travelers poking along the edge of a hurricane slingshot at high speed at infinity.

Dean couldn't keep his eyes off the sky. Starlight sluiced over us like quinine water and guava punch. An alien vista of the Milky Way, familiar but wildly intense. Whorls of gas and dust, a trail of spun sugar crystal. Individual stars guttered and prickled, twinkled and blazed. Nearer to hand, across from us, the underside of *Annie's* fuel wheel gleamed like the tracks of an archangelic railroad.

"All right, cowboy," Mikol said. "Whaddaya think?"

Dean, his eyes aflicker, continued to gape into the sprawl of God's candelabra.

"Mr. Mikol asked you a question, Dean."

"My friends call me Kaz," Mikol said.

"Kaz, that is," I said.

(I'd wondered if he had any friends. Bao referred to him only as a professional colleague, and a nettlesomely frosty one at that.)

"Suhr?" Dean said, fuddled.

"Mr. Mikol—Kaz—wants to know what you think of all this."

A second or two lapsed before Dean could find the words he wanted: "Priddy. Holy crow, very priddy."

Kaz patted Dean's knee and laughed.

Peeter inched ahead—in a steep, gleaming silence that held the three of us like prehistoric waterwalkers in a blister of see-through resin. The wheel turned as Peeter inched as *Annie* leapt gully after gully of the interstellar chasm. . . .

Then Kaz—our old nemesis, Kazimierz Mikol—began to talk, his hands in his lap, the methodical wheel of his mind dipping memories from the millstream of his boyhood:

"My grandfather was an immigrant from the liberated Warsaw Pact nations of eastern Europe. He

settled in newly democratic Cuba and set up a small factory in the foothills of the Sierra Maestra, manufacturing a vehicle of his own design that ran on a nonpolluting, replenishable fuel distilled from pig shit and sugar-cane fibers. Cuba had lots of pig shit and sugar cane. Grandfather Alexej's oldest son, Milan, who attended university in Poland in the double-twenties, developed the Mikol Process, a type of nanomechanization that brought down the price of the Sabio, our most popular model, so that even streetcleaners in Havana could afford to buy and drive one. In fact, Milan Mikol, my father, stands in relation to my birth century, at least in Cuba, as Henry Ford stood to the twentieth century in North America."

Kaz had apparently aimed this speech at me, for Dean had tuned him out right after the second mention of pig shit. In our bubbletop, Dean hung beneath the stars like an Earth kid on a midsummer swing.

"I grew up with a sister, Marisa, afflicted with a host of weaknesses that forced my mother to devote herself to her like a nurse. You or I would say that Marisa had cerebral palsy, with severe hemiplegia and ataxia. Mama denied this and said her disabilities stemmed not from brain trauma at birth, but from the influence of an individious toxin made in the States and sprayed relentlessly on the cane crops of our province. No matter. Marisa had many handicaps; at first, not even constant attention and coaxing enabled her to learn to speak."

Kaz's story had begun to make me uncomfortable. I looked past Dean, who sat between Kaz and me, and asked, "Why tell me all this?"

"Just listen, okay?" Annoyed, he resumed: "The year I was thirteen, Marisa turned eight, and my mother's youngest sister, Helena, just then ten or eleven, jetted over with the Brodkorbs from Poznan—for a visit and a reunion. Helena spelled Mother with Marisa. She spelled me, too, because, hating the task, I now often found myself acting as a care provider. I may have welcomed little Helena to Ciudad Sabio even more vigorously than my mother had, because Helena's presence freed me to swim, hike, and play *beisbol*.

"That same autumn, a movie company from Florida built an amusement park on Pico Torquino, the tallest mountain in Cuba, only a few kilometers from our Sabio factory. The jewel of this set was a Ferris wheel that the filmmakers erected as close to Torquino's summit as they could safely get it. Then, once production had halted, the company's publicity department let it be known, in and around the Sierra Maestra, that locals could ride the Ferris wheel for the equivalent of fifteen American dollars a person on the last three days of October. After the last ride, the company would dismantle the device and return Torquino to its more or less natural state, prior to production.

"Marisa heard of the Ferris wheel. By this time, she had a computer that gave her a voice—a lilting little girl's voice—and she told Mama that she wanted to ride Vireo Films' greatly ballyhooed amusement. She wanted this boon as a birthday gift, before Vireo's roustabouts broke the wheel down and shipped it back to Florida. But, of course, if my parents granted Marisa this wish, they couldn't allow her to ride the Ferris wheel's gondola alone.

"I would have to go with her. I despised North American films and the nauseating hoopla that went with them, and so I absolutely hated this idea. In fact, I had a perverse nostalgia for the days of Fidel Castro, the sort of socialistic idealism that only the well-off son of a millionaire capitalist could afford to indulge. I didn't want to go. I didn't want to take Marisa.

"Helena intervened. She said *she* would ride with Marisa, if Diego, our household's major-domo, drove the two of them up Pico Torquino to Vireo's make-believe amusement park. (Even at thirteen, I heard this last phrase as an egregious bourgeois tautology.) She said it was fine if I chose to stay home,

for the combined altitudes of the peak and the Ferris wheel would probably simply cause my snotty nose to bleed. This insult—reverse psychology?—worked, and I angrily offered myself up as Marisa's guardian on this expedition after all. Two evenings later, Diego drove Marisa, Helena, and me up the mountain so we could ride in one of the bright gondolas of the film company's Ferris wheel."

I began to see—dimly, at least—where Kaz was going with this story.

"We rode the wheel—Marisa, Helena, and I. We rode it an hour after sunset. Marisa sat between me and her pretty young aunt from Poznan. What can I say? My nose didn't bleed, but the combined heights of Torquino and that stately illuminated wheel made me tremble like a palmetto leaf in the salty October wind. Believe me, I shivered uncontrollably. Marisa, however, loved the entire experience.

"When our gondola stopped at the top of the wheel and swung back and forth in its gyros, with the south Cuba coast and the smoky mirror of the sea arrayed below us like glossy infrared photographs, Marisa barked her approval—a clipped, excited gasp; a call from the heart. The wheel itself blazed, and the stars of autumn . . . *Dios mío*, some of them seemed to swim in and out of view, shyly, like bronze or pewter carp."

Kaz fell silent.

I laughed nervously. "Remind me never to challenge you to a duel of similes."

"What I understand now," Kaz finally went on, "is that in that Ferris wheel gondola, poised above the darkened island, I loved Marisa, I loved Helena, and I loved the simple day-to-day astonishments of living. Down from Pico Torquino, however, the world—my world, anyway—seemed to change. The Brodkorbs went back to Poland. My mother returned to fussing over Marisa and ignoring the rest of us.

"By the following February, my parents had divorced. Mama, taking Marisa with her, rejoined her sister's family in Poznan, and my father immersed himself in design revisions, production goals, marketing strategies. He died four years later, on a business trip to New York, when Sashimi, a guild of militant Japanese whalers, exploded a pocket nuclear device in a subway tunnel under Grand Central Station. I was in my first year at Havana Tech, gearing up to study particle physics and vacuum propulsion systems."

Even though it seemed that he had just begun another story, Kaz stopped.

"Is that all?" I asked.

"All my life, I blamed Marisa for the loss of my parents. Two days ago, upon learning of Helena's death, I remembered something I couldn't quite remember. Please don't laugh. You see, this incomplete memory softened me. Only when we boarded Peeler and started crawling toward D-Tower did the memory come totally back to me. I have just told it to you, Dr. Gwiazda."

"Abel."

"Abel, then."

Peeler docked with the observatory complex at the summit of D-Tower. Dean had a crick from staring heavenward during our crossing—so, while ambling through the docking connector, he bemusedly rubbed his neck.

In D-Tower, despite *my* misgivings, I believe it gratified Kaz—oddly gratified him—when Dean insisted on going with us to Helena's memorial service: the voiding. (This last term offends me even more than

does *ejection*, but, over our trip's past quarter century, it has gained currency and a certain cachet; the puns it embodies are, if nothing else, vivid and expressive.) Kaz realized that Dean wanted more to keep him, his new-found friend, in sight than to attend the funeral of a stranger, but I set aside my objections, and all three of us turned up on part of the observatory deck given over to, well, voidings.

To Kaz's obvious surprise, thirteen people, including our party from G-Tower, had come to honor Helena, who lay, just as promised, on the lingula of the ejector tube.

Commander Stefan Odenwald himself, looking distinguished but gaunt, headed this group of mourners, which also comprised Chaplain Mother Sevier and eight of Helena's friends and colleagues. The service, which I thought dignified and painfully moving, featured brief prayer readings by Odenwald and Chaplain Mother Sevier, a few words by a fellow geneticist, and a holovid of fifteen-year-old Helena singing "*Dona Nobis Pacem*" in a soprano as clear and chilling as ice water.

The holovid scared Dean, but didn't send him careening away from the ceremony. He grabbed my arm and held to it like Quasimodo clinging to a bell rope, his gaze shifting back and forth between the shimmering image of young Helena crooning like an angel and her aged-looking corpse, recognizable even to Dean as a transfigured but silent version of the beautiful hologhost. Adding to the eeriness of this experience was the fact that young Helena sang her part in rounds with an unseen orpianoogla and an invisible mixed choir. Indeed, their anthem echoed hauntingly throughout the deck.

At its conclusion, Odenwald said, "Mr. Mikol, as Helena Brodkorb's only living relative aboard *Annie Jump Cannon*, you have—if you wish it—the privilege of eulogizing her."

Kaz walked to the lingula, to stand in almost exactly the spot where the hologhost had sung. Bending, he kissed Helena's cold temple.

"From Pico Torquino to Epsilon Eridani," he said, standing erect again, "Helena Brodkorb was not afraid of heights. She dwelt on them. Like Harry Martinson, she knew that 'space can be more cruel than man, / more than its match is human callousness.' And so, unlike me, she was never cruel."

Which was all Kaz could steady himself to say. He put a hand over his mouth and stared at Helena's sunken eyes and lovely complexion. Meanwhile, Dean threaded a path through the other mourners to stand next to Kaz in mute condolence.

Odenwald said, "Shall we commend her now to the stars?"

Kaz nodded.

The lingula on which Helena Brodkorb lay retracted into its tube. A maintenance tech among the mourners used a remote to seal the tube and activate its plunger. Although no one on the deck could see her go, Kaz's dead aunt hurtled outward like a torpedo—far beyond the gravitational attraction of any of the armada's wheelships.

"Because we're decelerating," Commander Odenwald observed, "Helena Brodkorb will reach Epsilon Eridani before us."

"And eventually pass on out of the system into interstellar space again," said a colleague.

The company fell silent again. No one appeared to want to move.

After a time, I said: "May I speak?"

When Chaplain Mother Sevier nodded, I recited:

*"So
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*No
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"Amen," said Chaplain Mother Sevier, crossing herself.

Finally, we funeral goers broke up and departed.

Back in G-Tower, Kaz opted to remain up-phase for the remainder of our armada's voyage. He has been spelling me with Dean as once, years ago, Helena Brodkorb spelled his mother and him with his handicapped sister, Marisa.

We have entered the Barricado Stream, a region a good deal less clogged with debris than a few of our astronomers had earlier supposed. The probe dropped by *Zwicky* has determined recently that the Stream hosts only one substantial cometary mass per each sphere the approximate size of the Earth's orbit around Sol. Good news. Very good news.

"There's hardly any chance at all we'll hit a comet," Nita Sistrunk said yesterday in the G-Tower mess.

But Bao added, "It isn't the comet-sized bodies we must fear. Remember, though, if *big* masses whirl around out here, there may also be smaller but more perfidious bodies impossible to detect at a distance."

"What do you mean?" I asked.

"You don't really want to know." And Bao deftly changed the direction of our talk.

In any event, more and more personnel aboard our three wheelships have come up-phase. We still have some journeying to do to reach New Home, at least another standard year's worth, but excitement mounts. Also, the staggered awakening of adults from the enchantment of ursidormizine slumber has delighted the children, and each pulse of our matter-antimatter engines seems a quickening heartbeat. The peculiar atmosphere of a seminar-cum-carnival has gripped *Annie*; also *Chandrasekhar* and *Zwicky*.

I wonder if Pharaoh's royal architect had a like sense of culminating accomplishment upon realizing that only a few more blocks would complete his master's pyramid.

Lily has come up-phase. She still can't believe that nasty Kazimierz Mikol has ingratiated himself with Dean—altogether sincerely, however—as a kind of uncle. Nor does she believe that Kaz and I have become friends. And, in fact, I prefer Thich Ngoc Bao's company to his, or Nita Sistrunk's, or Matthew Rashad's, a compatriot among the geologists. Our personalities (mine and Kaz's, that is) scrape against rather than complement each other's.

Nevertheless, we've hammered out a crumpled sort of mutual respect. Lily can't imagine how. I've told her about Helena Brodkorb's death and our rim-car trip to and from D-Tower, but, not having experienced these herself, she remains skeptical of everything about Kaz except his clear, if startling, affection for Dean.

"It's like the tiger and the lamb on the same bed of straw," she says. "A fearful symmetry whose opposing balances I can't quite grasp."

"Don't try," I tell her. "Just enjoy."

Lily simply shakes her head and laughs, a gruff chuckle so like Dean's that I gape. My look prompts more laughter and a sudden peck on my cheek.

"I like you more today than when we first met," she says. "More than on DeBoy's last birthday, even."

"Why is that?"

"You've started going gray," Lily tells me. "I've always liked older men."

Commander Stefan Odenwald stood in *Annie*'s pilot house, supervising its computer-aimed passage through the Barricado. Our other two arks ran parallel to *Annie*'s course at port and starboard distances of about seventy kilometers. Nonetheless, each of the other ships remained dimly visible to everyone in the pilot house, either on TV monitors or through the shielded viewports of the domelike bridge. A

simultaneous look at the two vessels depended, of course, on the pilot house's rotating to either the top or the bottom of the fuel wheel's orbit vis-à-vis the headlong motion of the other two ships, but this happened often enough to thrill Dean and me, and seldom enough to increase our anticipation.

For a long time, I guess, Odenwald had realized that Dean enjoyed looking at the stars as much as anyone else aboard; therefore, he had invited us into the pilot house, a structure midway between Towers A-B and G-H on the ever-clocking fuel ring, and had there installed Dean in the thronelike chair that inevitably, and a bit sardonically, we call the Helm, as if it willy-nilly grants its occupant both authority and navigational savvy.

The Helm swallowed Dean. His feet dangled half a meter from the deck, and his chunky little body resembled that of a ventriloquist's dummy. Thankfully, he took no notice of the chair's scale, but turned his neckless head from side to side, ceaselessly ogling the universe.

"You look like—" Odenwald began. He turned to the other officers in the pilot house. "Who? You know, that holovid space explorer, what's-his-name?"

"I'm almost completely ignorant of such entertainments," I admitted—with an undercurrent of pride that Odenwald did not seem to find off-putting. It suggested, as it should, that I had better things to do.

On the other hand, I had often petitioned Odenwald for this audience, here in *Annie's* control center, for my handicapped son, and surely that petition told him more about me than did any cheap slam at the junk on holovid.

"Cuhn I?" Dean said. "Cuhn I steer?"

"Have you mastered astronavigation, wheelship helming, and the rights and obligations of cybernetic command?"

"No suhr," Dean told Odenwald meekly.

"Well, then, you can't steer. But you're the only person besides myself to occupy that chair since we left lunar orbit in our own solar system."

"So far as you know," I put in.

Odenwald laughed. "Yes. So far as I know."

The TV monitor taking transmission from the *Subrahmanyam Chandrasekhar* showed all of us on the bridge the face of a haggard Caucasian male. I recognized him as one of Commander Joplin's lieutenants, Wolfgang Krieg.

"*Attention!* Commanders Odenwald and Roosenno, *attention!*" the haggard face said. "We appear to be on a collision course with a stream of frozen debris—gravel, call it—that initially composed a single mass about two meters in circumference. This stream of material—"

Odenwald took the mike. "*Initially?*" he said. "What do you mean, initially? What happened to it?"

"When we radar-sighted the object, we could see it would hit us," Krieg said. "Having no time to change course, we used our laser to try to deflect it."

"By vaporizing one side of the body to push it in another direction?" Odenwald theorized.

"Yessir," Krieg said.

"But, instead of moving aside, the object fragmented?"

"Yessir. The resulting stream of debris will strike us in two minutes fifty-three seconds."

Odenwald said, "How may we assist?"

"Get yourselves out of here," Krieg replied. "You might also want to pray."

Odenwald gave an order to activate the siphons to draw fuel from the C-D to E-F hydrogen tanks down the spokes to their matter-antimatter propulsion system. Kaz appeared from nowhere to do exactly that, while Odenwald ran the ignition programs. Bridge officers on *Zwicky* followed suit. Despite their size, both wheelships shoved agilely ahead, out of the energy-saving coast marking the latest stage of our years-long deceleration process.

"Don't look at the exhaust trail!" I told Dean.

But Dean *was* looking at it, a blazing bore of magnesium-white light that had already turned our wheel's opposite inner arc into an eye-stinging mirror. If he kept looking at it, he'd burn out his retinas. Blessedly, just as I started to push his face into his lap, Dean averted his gaze.

At that instant, the monitor receiving from *Chandrasekhar* filled with popping kinetic snow. *Chandrasekhar* itself, one instant past a platinum ring on a bolster of sequined black felt, flashed out like a miniature nova, a wound of radiance even brighter than *Annie's* exhaust trail. Then, after the flash, in the place where the space ark had been: nothing but blackness. Every light on its rim, every light in its habitat towers, snapped out.

Immediately, though, a series of explosions on the wheel went off in astonishing sequence, like a silent Fourth of July gala with Roman candles, phosphorus bombs, and self-shredding parachutes of light. The sight of these distant fireworks froze me in place, for, as the disaster unraveled, there was nothing that anyone on either of our sibling arks could do—except imagine both the terror and the agony of our companions aboard the splintering ship.

Later, Bao and others postulated, the biggest chunk of the fragmented rock tracking *Chandrasekhar* had hit and severed its rim. Simultaneously, the gravel from Krieg's misguided attempt to deflect this object ripped into the fuel spokes *cum* support cables. Then centrifugal force took over, tearing the vessel apart. Broken tentacles of diamond writhed in the blackness. The electromagnetic levitation tanks holding the antihydrogen ice clear of the ordinary matter making up the ark's set-apart propulsion unit took ricocheting hits of their own, emitting, as a result, such hot bursts of radiation that the sky flared again and many of the ark's buckled compartments actually began to melt.

This catastrophe stunned me. I could think of nothing very like it in the history of spacefaring. The *Challenger* disaster might qualify, or the fate of the Chinese ship *Wuer Kaixi* off Titan late in 2057, but these events seemed so remote, and so happily limited in their life-taking scale, that the emptiness off to starboard, the afterglow of so many doomed lives, left me groping for some competent or humane response.

"Whuh?" Dean murmured. "Whud happen?"

Odenwald looked at him. Dean, in turn, looked to him for some hopeful reordering of the chaos that had inflicted itself on the sky outside our blister.

The incandescence, then the cold.

The kaleidoscopic brightness, then the dark.

"Please tell him, sir," I said. "And don't sugarcoat it."

Voices from *Fritz Zwicky* rattled in the pilot house. Radio operators in the communications well bent to their tasks. Two of Odenwald's lieutenants rushed in from the attached day room and lounge. Their concern—their activity—could not reverse the fate of *Chandrasekhar* or rescue a single person in any of its radiation-drenched habitation towers. All, like data in an irretrievably crashed program, were gone or going, already almost less than ciphers.

But it was Kaz, not Odenwald, who finally knelt in front of Dean's chair. "They hit something, or something hit them. A chunk of ice about like so." Kaz made a circle of his arms. "Maybe even a little smaller. Which split into pieces when the people on *Chandry* tried to move it."

"Bud how . . . ?"

"As fast as we're going, hitting an object that size makes a bang like the burst of a fission device." Kaz looked at me. "Sorry. He's never heard of Hiroshima, right? Or the Sashimi attacks on New York and L.A.?"

"Cuhd id happen to uz?"

Kaz looked to me for permission. I nodded.

"Yes, it could," Kaz said. "At the moment, though, we're outrunning the blast. If this helps at all, Dean, we should go fairly quickly if we hit something."

Dean began to cry. "I'm sorry thad happen," he said. "I'm sorree-sorree."

"Me too," Kaz said.

Odenwald came over and said he wanted Dean and me off the bridge. I picked Dean up, and Odenwald advised us to retreat to the day room while he spoke with Roosenno and some of his lieutenants about the morale and logistical implications of the disaster.

Dean and I left.

Two hours later, when it seemed to Odenwald and his closest advisors, including Bao, that we'd outrun any pursuing debris, our ships cut their engines and drifted back into the coasting mode of our long advance on Epsilon Eridani II.

If we survive the Stream, none of us will ever forget what has happened out here. Ever.

Mere chance enabled Dean to witness the destruction of another wheelship. Nonetheless, I blame myself for putting him in a place to see the spectacular melting or vaporization of sixteen-hundred human beings.

And Dean? He understands that *Chandrasekhar* and all its passengers have passed into physical oblivion. Kaz and I both tell him it's possible that God has received their souls, but, despite my religion, I remain a militant skeptic on this point, and Dean no longer asks if the victims of the disaster have gone to heaven. It both frets and wearies him to hear me say, "Dean, I don't know."

He also grasps, by the way, the perilousness of traveling at even a mere fraction of light-speed. He knows that *Annie Jump* or *Fritz Zwicky* could blaze out, novalike, as Commander Joplin's wheelship did. This knowledge has penetrated his awareness as deeply as, if not more deeply than, anything else he has ever learned. Sometimes (for me, red-letter occasions for guilt and moroseness), he remembers the

catastrophe, bolts upright, and begins to rock and sway.

"Why?" he says. "Why?"

The basic existential inquiry.

And I wonder if Lily and I sinned against Dean, ourselves, or the incessant nag of the life force by bringing him to be in this precarious flying tin can.

Kaz says to ice the gloom-and-doom, the self-debates, the ontological kvetching.

A word to the wise? Not with *this* target audience: I don't qualify.

An arkboard month has passed. We have broken clear of the Barricado Stream—computationally, if not in our hearts. Our learned astronomers inform us that we have wide riding ahead, unobstructed glissading to New Home. Scant solace to the dead, of course, and scant comfort to either Dean or me.

More than once I've tried to eulogize the victims of this prodigious calamity. My words back up on me; my rhymes, even the off ones, don't quite slot; my rhythms, sprung or unprung, drill like drugged anacephalics in jackboots. At last I wrote a stanza:

*With a charged, chance suddenness,
The all of spinning Chandrasekhar,
The all of its ark, flashed to dark and spun to less
Than a heat-dead, hooded star:
A nova, an aura, an aroma of light-speed-sizzled thought,
Brains broiled, skin fried, the atomizing mystery and mess,
Actinic sabotage of each blind arrogance we bought
With the hardware-software-psycheware of our ever-shoving-onward high-tech-tied success.*

Yesterday Bao asked if I've made any headway on the elegy everyone assumes I'll write. Reluctantly, I showed him this stanza. "Read it aloud," he said. There in the G-Tower mess, I lowered both head and voice and recited it.

Only Bao, thank God, could hear me. Kaz would have flung my comppad aside and stalked off, to seek better company in the finch-filled atrium.

"That's pretty," Bao said. A dig.

"So was the little mishap that triggered it."

"True. But I would have never taken you, my friend, for a Hopkins enthusiast."

This remark startled me. Bao had realized from the get-go that the paradigm for my stanza was an elegy by Gerard Manley Hopkins. I sat back and stared at him.

"Nor I you," I said.

Bao laughed. Then, with no physical prompts whatsoever, he recited:

*"With a mercy that outrides
The all of water, an ark
For the listener; for the lingerer with a love glides
Lower than death and the dark;
A vein for the visiting of the past-prayer, pent in prison,
The-last-breath penitent spirits—the uttermost mark
Our passion-plunged giant risen,
The Christ of the Father compassionate, fetched in the storm of his strides."*

"How can you do that?" I said. "Remember it all?"

Bao laughed again. "Stanza thirty-three. Because I've had Heraclitus call it up repeatedly since the accident. Balm from a long-dead Jesuit."

"I would have never taken you for an incarnationist, Bao, and certainly not one of a papist stamp."

Nothing marred Bao's hollow-cheeked amiability. "The wise take their comfort where they can."

"The wise seldom choke down such bilge."

Bao, grunting, grabbed his chest as if I'd just slipped a blade into his heart. He recovered at once, a fey smile on his lips. "Your stanza clatters where the Jesuit's sings, my dear unable Abel."

"Then I guess I'd better delete it."

"Ah, a wiser man than I'd supposed." He put a hand on my wrist. "Don't, though. Save it, as a ward against hubris." He released me, finished eating his vegetable shell, and, with a smile and a bad parting joke, excused himself. None of Bao's observations on either wisdom or comfort-taking had recast my own opinions; however, sitting and talking with him had cheered me. I kept the lone stanza of my come-a-cropper elegy, but attempted no others.

Later, in a geology carrel, I had Heraclitus call up "The Wreck of the Deutschland" and read it twice from beginning to end. If mere language can redeem a disaster, I believe Hopkins redeemed his.

Fuel rings turning like mountain-high Ferris wheels, *Annie Jump* and *Fritz Zwicky* have completely traversed the Barricado Stream. We have penetrated the orbit of Epsilon Eridani V, the system's outermost planet, an ice ball known to every member of our expedition as Cold Cock. New Home lies nearly 5.7 billion kilometers farther in, in the direction of Eppie herself; and our fleet, calamitously dispossessed of one of its arks, flies at a scant percentage of light-speed, a million kilometers per hour. At this rate, given the need to slow still more, it will take almost a year to reach our destination.

The hydrogen harvesters we deployed shortly after entering the Barricado, great funnels of molecularly strengthened mylar, will not only add calibrated drag to our deceleration, but resupply the exhausted tanks on the rim arcs between habitat towers. From the G-Tower observatory, it sometimes appears that we haul behind us the iridescent bladders of immense Portuguese men-of-war. Floats or wings? No one seems to know how to regard them. Sometimes, we can't see them at all. In any case, gathering hydrogen makes little sense, given that, by the time we reach New Home, our ships will have almost wholly depleted the antihydrogen ice required by our matter-antimatter rockets for further travel.

Ours not to reason why . . .

Days (or arkboard hours comprising their equivalent) ghost past as our last two vessels simultaneously plummet and wheel through this alien system. Up-phase scientists, technicians, engineers, and support personnel work methodically to prepare for planetfall and the colonization of New Home. Much of this preparation—plan comparisons, logistical projections, computer simulations—has to do with adjusting for the loss of the vital skills and labor units destroyed along with Commander Joplin's *Subrahmanyan Chadraseskhar*. On the other hand, our expedition's organizers factored in an atoning redundancy: personnel on any one ark can meet and overcome, by themselves, the environmental challenges of our target world. If a disaster befalls *Zwicky*, then *Annie* has the wherewithal to succeed.

And, of course, vice versa.

Less than halfway to the gas giant Jawbreaker (named for its bands of umber, licorice, and cherry, as well as for the fact that it has more than twice the mass of Jupiter), an astronomy group met with Odenwald in the observatory. This group (as Thich Ngoc Bao told me later that same evening) consisted of Nita Sistrunk, Indira Seschachari, Pete Ohanessian, and Bao himself.

Actually, after putting Dean to bed in our cubicle on the mezzanine level, I hitched a lift to the observatory for some private time to unwind and found Bao slumped in a swivel chair in a consultation bay not far from the ABVT. The door to this bay stood open, and, upon sighting Bao, who had made himself uncharacteristically scarce for the past seventy-two hours, I slipped in and greeted him.

"Hey."

Bao jumped as if I'd popped an eye-eye in front of him. Recognizing me, he composed himself and gave me a wan grin. His skin looked sallow, drum-tight.

"Doctor," I said, "what's up?"

"The jig," said Bao. "Old American expression. The game is over. Our hopes are dashed. Or, at least, a hefty plenty of them."

I sat down in a swiveler across from Bao, in front of an HD screen as big as a door. "We're surfing different wavelengths, friend o' mine."

"Tonight," Bao said, "our group presented to Odenwald the radio, spectro-graphic, and visual evidence that New Home may not be habitable to human beings."

My gut corkscrewed around itself. "Come again."

"We did so—Indira, Nita, Pete, and I—as if discussing mutation rates in fruit flies. Very professionally. As if our findings had only hypothetical significance to our arkmates and the people on *Zwicky*. In truth, we all felt blown away, Abel—nuked, one could say."

I leaned forward. "Bao, are you violating confidentiality telling me this?"

"I hardly think so. Tomorrow morning, the news will have spread all over both ships."

"Then go ahead. Tell me."

Bao rocked back, resting his ankle on his knee. "All right. Nita showed Odenwald a series of photographs—computer amplified and enhanced—revealing New Home as an ugly-looking marble, a hard little sphere rotating under drifting rinds of reddish-brown dust and ejecta. The water we discovered by spectrographic analysis while outside the Barricado lay hidden under enmantling dust. Odenwald

stared at us—his magi, so to speak—as if we'd led Herod right to him."

"*Ejecta*?" I said. "What's going on? Volcanic activity? A worldwide dust storm?"

"Odenwald asked the same question, and Nita said, 'The dust storm's real enough, but Bao worries more about its causes.'

" 'What do you think's happened?' Odenwald asked me. 'I told him that not long ago—possibly just before we drew within the orbit of the fifth planet—an asteroidal object the size of Mexico City burned through New Home's atmosphere and impacted with the surface. The stratospheric blizzard wrapping the planet derives from material crater-blasted upward by this nomadic body's impact.'

"Odenwald turned over one of Nita's lovely gloomy photos, as if its other side would nullify my words. When it didn't, he thoughtfully replaced it in its sequence.

" 'What does this mean for us?' he asked. 'As refugees in search of a livable world?'

" 'Nothing good,' Pete Ohanessian said.

" 'Itemize, please,' Odenwald insisted.

Nita reached over and touched his wrist—trying, you see, to console him. Meanwhile, though, she told him that infrared absorption spectroscopy would give us the best look at current conditions on the planet.

" 'Dr. Seschachari has the results,' she said. 'Indira?' "

Here, Indira had showed him a slide. So Bao punched a button, and the very slide in question flashed up on the HD screen behind me. When I swung about in my chair to look at it, an arrow jumped onto the screen over New Home's latest IR absorption spectrum.

Bao resumed his story:

"Indira said, 'This slide compares data taken on the trip out with more recently obtained info. This peak at around ten microns' "—the arrow landed on it— " 'is carbon dioxide, and you can see from the corresponding peak here' "— the arrow bounced again—" 'that the atmosphere's carbon dioxide content has risen dramatically as a result of the collision. We hypothesize that the vaporization of a lot of carbonate rock—namely, limestone—from the asteroid strike triggered the jump in CO₂. You can also add to that the CO₂ produced by the combustion of biomass—grasses, trees, who knows what else?—in the resulting firestorm. But even more alarming is that the levels of carbon dioxide continue to rise.'

" 'Why?' Odenwald demanded."

Indira told him she'd get back to that and noted that the second peak on the spectrum represented the absorption from the NO molecule, nitric oxide. Bao, quoting Dr. Seschachari, said that fumes from nitric oxide present two real problems for would-be colonists. First, the acid has a bite. Only idiots would try to land with it contaminating the ecosphere. Second, and even worse, the nitric acid has apparently begun to release even more carbon dioxide from New Home's limestone. To get an idea of the process, think of sodium carbonate—ordinary baking soda—in a bath of vinegar, fizzing away.

" 'Cripes, Bao, you've got to be kidding.' "

"I wish." He got up and began to pace. "Pete Ohanessian took over from Indira and told Odenwald that the most efficient natural mechanism for removing CO₂ from a world's atmosphere is probably

photosynthesis. Unfortunately, Abel, we think the asteroid strike and the firestorm have wiped out all but about five percent of New Home's vegetation. God, or Fate, has smashed the thermostat on that planet. When New Home comes out of its Ice Age—below-freezing temperatures everywhere, all a result of the dust cloud shrouding it—Pete thinks the planet could fall victim to the runaway greenhouse effect."

In this scenario, Bao told me, atmospheric CO₂ provokes warming via standard greenhouse action. Carbon dioxide levels in cold water drop with added temperature, even more CO₂ outgasses as CO₂ once dissolved in polar oceans comes out of solution. Hence, even faster warming. As temperatures keep going up, the seas begin to evaporate, and H₂O is a more powerful greenhouse gas than CO₂. Water and carbon dioxide working together slow the escape of infrared energy into space. The hotter New Home grows, the more water vapor in its atmosphere: a steady ramping up of the greenhouse effect. Many thick blanketlike layers swaddle the planet, letting solar heat in but trapping the heat generated below. Eventually, New Home's equatorial seas start to boil.

"New Home seems to be something of a misnomer," I said.

Bao chuckled mirthlessly. "Well, perhaps not. We've done some very careful modeling to establish how close the planet is to the edge of Epsilon Eridani's habitable zone. It does lie on the inward edge of the zone, but at sufficient distance from Eppie to avoid a complete greenhouse runaway."

"Won't things ever get back to normal?"

"What's normal?" Bao said. "But, of course, that's what Odenwald wanted to know. Pete told him that a counterbalancing geological process could reverse the situation." Bao grinned a dare at me. "Any idea what it is, *Dr. Gwiazda*?"

The question took me off guard. "Weathering?"

"You're the geology man. I'm asking you."

"Weathering," I said more forcefully.

"Care to explain it?"

"Spectroscopy implies New Home's mantle consists of calcium and magnesium silicates, right?"

"I guess so. Pete, at least, concurs."

"Then the planet's atmospheric CO₂ will react slowly with these silicates to make calcium and magnesium carbonate. The process speeds up in hot, damp air, binding carbon dioxide into the planet's limestone. Temperatures drop. With this cooling, water vapor precipitates out. The greenhouse effect decreases, along with the temperature. In the end, New Home returns to 'normal.' How long will it take? I don't know. My specialty is soils. And we still don't know the percentage of anorthitic rock in New Home's exposed crust."

Bao smiled. "Maybe you should have briefed Odenwald too."

"What time-scale estimate did Pete offer?"

"He hemmed and hawed. I don't blame him. We lack solid values for anorthitic rock and the rate of vulcanism."

"Come on, Bao."

"A century or so. For sure, less than two hundred years. Maybe as few as fifty."

Hearing this, I thought first of Dean, now asleep in Lily's care. Such news would crush him. Lily, too. It was crushing *me*, like sixteen tons of granite on my chest. Had we traveled more than a century to reach a world that would accept us as colonists only after we had stewed in our bioracks another one hundred years?

"Yes," Bao said. "New Home's something of a misnomer." He punched a button on the arm of his chair and the speakers next to the HD screen activated. A recorded discussion garbled past on fast-forward. Bao stopped it. "After Pete talked, some of my colleagues got silly. Listen."

Nita: "Dead End might be a better name."

Indira: "Or Crater Quake."

Pete: "Or Pot Hole. Or Acid Bath."

Nita: "Gloomandoom!"

Indira: "Bitter Pill! Or maybe—"

Bao: "That's enough!"

Odenwald: "Easy, Bao—I was about to propose an irreverent name of my own."

Bao: "Sir, the purpose of this session is to brief you, not to divert ourselves."

Odenwald: "Maybe we should divert *Annie* to another planet in this system."

Nita: "Which? Jelly Belly? Red Hot?"

Pete: "The gravity on Jawbreaker would crush us. We'd do as well to set down on Eppie herself."

Nita: "Or as ill."

Bao: "We should continue to New Home. First-hand studies of the environmental aftermath of an asteroid strike this large are virtually nonexistent. We should follow up."

Indira: "But for whose sake?"

Odenwald: "You all have your work. I have mine. And my first duty is to break the news."

Nita: "You'll break hearts as well."

Pete: "A better time might be—"

Odenwald: "Traveling at nearly a million clicks per hour, there's no time like the present."

Bao halted the recording.

"Nita was right," I said. "The news has broken my heart. And it's sure to break others."

Bao toasted me with an imaginary shot glass, then slugged back its imaginary contents.

Lily broke the bad tidings to Dean. She insisted on her prerogative in this. In his self-appointed role as goduncle, Kaz tagged along.

We took Dean to a glade in the atrium, a stand of sycamores bonsai'd artfully near a waterfall encased in a sort of panpipe of clear plastic. In this secluded place, the falling water, pump-driven and recirculated, made its tremulous woodwind and brook music.

Kaz lifted Dean to a notch in one of the sycamores and then tactfully wandered away. Lily took up a post beside Dean, to catch him if he slipped, while I sat on a bench masquerading as a ledge on the face of our miniature cascade.

Finches warbled, and, not far away, another party murmured among themselves, their talk a faint counterpoint to the water noise and the nonstop background hum.

"DeBoy, I have to tell you a very unpleasant thing," Lily began. "New Home won't be our new home, after all." She told him about our discovery of the recent asteroid strike and its meaning for everyone aboard our remaining ships—namely, either a frustrating wait until environmental conditions improved on Eppie's second planet or another long interstellar journey to another solar system with potential for settlement, most likely the Tau Ceti system.

None of this seemed to impress Dean. He sat in the dwarf sycamore gazing upward, and all around, for a glimpse of one of the finches.

"Do you understand me?" Lily asked. "We've come all this way, DeBoy, and New Home may be denied us."

"Yessum." Dean gave her a grudging, shifty-eyed nod.

"It's all right to feel sad. It's even all right to cry."

Our ingrate son kept rubbernecking for birds.

"*Dean!*"

So quickly did Dean's gaze snap back to Lily that he had to grab a limb. "I *like* id here," he said. "Now thad evvybody's ub . . . *up* . . . I like id jes fine."

Almost against my will, I guffawed.

Lily shot me an I'm-going-to-kill-you glare that modulated, almost against *her* will, into a defeated grin.

Whereupon Hiller Nevels, a botanist named Gulnara Golovin, and Milo Pask, a habitat engineer, came strolling toward us, arguing or at least expostulating among themselves. Golovin had her hand consolingly on Pask's arm, and none of the three seemed at all aware of our own family group, not even when Kaz trudged back into the clearing and halted in some puzzlement at the sight of them.

". . . *won't* get over it!" Pask was saying. "To travel over a century and learn on your final approach that a stupid rock from the sky has turned the planet of your dreams into a gas chamber! Why did I come? I'm supposed to build habitat geodesics, water and sewer systems. Now, I can't. I've come all this way for no reason!"

Golovin said, "You can't do your job *now*, that's all this setback means. Wait for the dust and the acid rain to settle out. A kind of normality will return to New Home. What's another year—even two—given

all our years in transit? Milo, from the very beginning we knew we were living with a deferred ambition."

"Besides," said Hiller, "we had no guarantee any planet out here would prove a cozy place to camp."

Pask brushed Golovin's hand from his arm and rounded on Hiller. "Maybe not when we set out. But the closer we got to Eppie and the more that thickheaded gook and his star-gazing cronies learned, the more flowery they got about how New Home was Shangri-La and how grandly the place would welcome us. We hadn't come all this way just to rot in our bioracks. So they told us. The incompetent buggers!"

"Except for the asteroid strike, I think they appraised New Home accurately," Golovin said. "I don't see how you can hold them responsible for an act of God."

"We can't even hold *God* responsible for an act of God!" Pask raged. "So I'm scapegoating Thich and his sickening ilk. Do you mind?"

"Irrationality doesn't become you, Milo," Golovin scolded. "Stop it."

"No. But I become it, don't I?" Finally catching sight of Dean, Pask strode over with a weird glimmer in his eyes. "Who could have predicted this turn of events? This kid? Yeah, the kid. *Annie's* resident . . . gnomish gnome."

Lily said, "Lay off, Milo."

Pask reddened as if she'd disparaged either his engineering skills or his virility, not simply rebuked him for bullying a child.

"What're the odds?" he asked. "What're the odds that New Home would take a lousy asteroid hit during our expedition's final approach?"

"I have no idea," Lily said.

"Well, I'll tell you. Statistically, Dr. Aliosi-Stark, the chances are something like a trillion to one. *A trillion to bugging one!*"

"I don't think so," Lily said.

"You don't, do you?"

"Given the event itself, I'd say that, statistically, the chances are one hundred percent."

Now Pask looked at Lily as if she'd slapped him. His face crumpled. Without attempting to mitigate or hide the fact, he began to cry. Dean followed suit. I took Dean out of the tree and held him. Lily hugged Pask.

"I want to leap into the same swallowing blackness everyone on *Chandrasekhar* leapt into," Pask said.

"You should talk to someone," Lily told him.

"I've talked to Hiller and Gulnara," Pask said. "Now I'm talking to you. Talk doesn't heal, it just turns into more of itself." Regaining a degree of control, he wiped his eyes and reset his twisted features.

Seeing Pask calm himself, Dean quieted.

"That may be," I said. "But you should still sit down for a while with Etsuko Endo. Soon."

Pask wouldn't commit to this, but Golovin agreed to contact Etsuko on his behalf. Then she and Hiller led him out of the glade, and out of the atrium, in search of someone to dismantle his dread.

Kaz took Dean from me, and Dean leaned his head on Kaz's shoulder. "I like it here," Dean said.

Whether he meant this nook of the atrium or life in general aboard the ark, I had no idea.

New Home—or Acid Bath, or Dead End, or Bitter Pill, as the more mordant of our expedition's surviving members insist on calling the world—has no moon. Not long ago, *Annie Jump* and *Fritz Zwicky* took up orbits about ten thousand kilometers out, orbits that bestow on them—in the minds of our astronomy specialists and a few of our anonymous dreamers—exactly that status.

The two great ships, their own wheels rotating, turn about New Home like diamond-lit satellites, *Annie Jump* half a klick farther out—higher—than *Fritz Zwicky* but otherwise in rough parallel with its sibling. If any sentient species lives on the world below, and if roiling dust didn't veil the night sky from the ground, the sight of our two staggered wheels turning overhead would surely prompt stillness and then awe among their unknowable kind.

Aboard *Annie*, I imagine myself swinging in the gondola of a Ferris wheel on a lofty New Home peak, gazing into the night at this manmade binary cluster. In fact, I go on to imagine myself imagining myself as a passenger on one of our glittering rings. Lost in this double fantasy, I prefer the image of myself in New Home's transfigured sky: Orion orating in the heavens, not some mute Sherpa in the Himalayas.

I want to blaze, not to slog and grapple. Given my choice, I want to god-fashion myself in fire—even if the attempt slays me, even if no one but the greedy homunculus in my own breast hears my Promethean cri de coeur.

At 0800 hours tomorrow—measuring time by Greenwich mean time, as we still do aboard *Annie*—we will boost away from New Home and park ourselves nearer her sun, to begin the refueling process that will eventually take us to Tau Ceti.

The majority of us will travel down-phase, in ursidormizine slumber. Commander Stefan Odenwald will yield the bridge and his primary continuity-preserving duties to Hiller Nevels and a fresh team of self-sacrificing troubleshooters, all volunteers, for Odenwald hopes to wake with legs fresh enough to climb a lovely new peak on the world that we discover and colonize in the Tau Ceti system.

Who can blame him? He has aged beyond any of the rest of us, excepting only Commander Roosenno, who will stay here in the Epsilon Eridani system, and Commander Joanna Diane Joplin, who ceased aging forever in the fatal millrace of the Barricado Stream.

As noted, the personnel aboard *Zwicky* will remain in orbit around New Home for as long as it takes to outlast the surface inferno brought about by the impact of the asteroid that Bao has named Epimenides, after a figure in Greek mythology who, while seeking a lost sheep, fell asleep for fifty-seven years and on awakening resumed his search unaware that so much time had passed. The oracle of Delphi then recruited Epimenides to cleanse Athens of a plague. Bao sees parallels between our slumbers and Epimenides', and between *Zwicky*'s task upon coming awake and that of the ancient Greek shepherd.

Briefly, Roosenno, like Odenwald, plans to send most of his would-be colonists down-phase until

planetary conditions permit their revival. Then they will undertake the daunting task of turning New Home into a permanent human colony. Blessedly, the ark-to-ark redundancy of our skills makes the separate agendas of our ships both feasible and attractive. The survival of our kind, we feel, depends not only on diversity, but also on our projection across as much of the inhabitable or terraformable galaxy as we can reach.

How did we make these decisions? Most democratically, in the extraordinary session I will now describe.

Twelve days ago, when Odenwald first broached this plan in the auditorium of *Annie's* A-Tower, few of us could credit that he wanted us to vote on an "option" as hare-brained as *resuming* our expedition. We had gathered, after dozens and dozens of rim-car trips, to discuss the issue in face-to-face assembly (rather than from separate electronic carrels), and the first question from the floor surprised no one, least of all Stefan Odenwald himself.

"How can we go on to another solar system when by most cogent reckonings, we've nearly exhausted our supplies of antihydrogen ice?" Thorn Koon asked this for everyone but about thirty techs and/or scientists already in the know.

At the head of our banner-hung auditorium, Odenwald asked Thich Ngoc Bao to reply. Bao stepped to the podium to address us: "Good evening."

I had Dean in my lap, for Odenwald had told us that no one should miss this gathering; that, in fact, children should also attend.

So when Bao said, "Good evening," we replied in kind, like children answering a teacher.

Dean, waving crazily, called out, "*Bao! Bao! Bao!*" until I brought his arm down and whispered as quietly as the noise level allowed, "Hush, DeBoy. Hush."

Dean hushed.

"Hydrogen is no problem," Bao said confidently, his reedy voice echoing. "We harvested this fuel during the deceleration process, from the Barricado on in."

"What about the antihydrogen?" Thorn cried. "Do you guys plan to turn regular hydrogen molecules inside out?"

Bao shifted his weight. "You should know that every ship in our armada, including *Chandrasekhar*"—he briefly shut his eyes—"was built with the capacity to generate antihydrogen for travel *beyond* the Epsilon Eridani system."

This news stunned most of us in the A-Tower auditorium. *I* had certainly never supposed us to have the ability to journey to another system, perhaps even back to Earth. And none of my friends—with the conspicuous exception of Thich Ngoc Bao—had suspected it either.

"How can we do that?" somebody shouted.

"Each ark is also a cyclotron, a particle accelerator," Bao said. "Each accelerator runs right down the underside of the fuel wheel itself, around its circumference. Given enough time and energy, the cyclotron belting *Annie Jump* will produce the hydrogen antiprotons necessary to fuel our journey from here to Tau Ceti."

Across the hall from where Lily, Dean, and I sat, Milo Pask stood up and shouted, "You geniuses kept this a *secret*? Why? Are we nonphysicists mere freeloaders? Idiot peons unworthy of consultation?"

Odenwald rejoined Bao at the podium. "Please recall that when the U.N. originally began planning a mission to Epsilon Eridani, we didn't know for sure if any planet out here would prove suitable for colonization. We thought it highly likely, of course, but didn't really know."

"Sir, what's your *point*?" Milo Pask asked.

"Simply that our mission's first mandate was one of hopeful exploration. Originally, then, U.N. planners allotted us only *two* ships, both of which were to have antimatter factories so that they could return to Earth after exploring the target star system. In that scenario, I'll remind you, *Annie Jump Cannon* didn't even exist."

Pask, peevishly flushed, was still on his feet, and an undercurrent of impatience—lapping the commander, not Pask—ran through the hall.

"During this initial planning," Odenwald went on, "off-Earth telescopes on Luna and the moons of Mars strengthened the case for a habitable planet here in EE. As a result, our mission changed, from one of exploring and establishing a permanent base if conditions allowed, to one of pure colonization. That change led us to add a third ship and extra people, not only because many more nations were clamoring to take part but also because planting a successful colony requires a diverse genepool and a third ship would give us insurance against an act of fate. In this, by the way, you can see how prescient the U.N. planners proved themselves."

"What about the antimatter factories?" Pask yelled.

"When we added *Annie*, mission costs skyrocketed. The most effective way to cut costs was to dump the notion of putting an accelerator on each vessel. Bao here, along with Trachtenberg and Arbib, considered that suicidal; the manufacturers of our wheelships thought it a kind of sacrilege—namely, bad design—and worked fiendishly to come up with a dirtcheap redesign that would save the antimatter factories. They did. Then they shunted their costs into other systems, at least on disk, and actually built the accelerators. Unfortunately, they couldn't test them without betraying their presence, and they had no money for testing anyway. So the planners kept them a secret—to prevent protests, work stoppages, maybe even the collapse of the entire project."

Pask was having none of this. "Why keep the accelerators a secret once we'd fled our Earthbound debts? It all smacks of a sleazy elitism!"

"Damned straight!" people cried.

"*¡Eso es verdad!*"

"Go get 'em, Milo!"

"*¡Claro que si!*"

Like a bidder at a noisy auction, Odenwald raised his arm. "True, once we were on our way, no one on our dirty, anarchic planet was going to stop us. We had what we needed, and we ran so far beyond Earth's jurisdiction as to become a species apart from those left behind. So we stayed mum, both over the radio and aboard our ships, out of respect."

"*Respect?*" several people cried incredulously.

Odenwald increased the gain on his mike. "We didn't want to rub our patrons' noses in either our early defiance or our present freedom. More important, we were afraid the cyclotrons might not work. We had no reason to try them while in transit and no desire to raise false hopes about their capabilities if the trip to Eppie went forward smoothly, as it did until we hit the Barricado. And even the painful loss of *Chandrasekhar* did nothing to persuade Commander Roosenno or me we should tell you the accelerators existed. What for? Epsilon Eridani Two—New Home—still looked to be a viable colony site. So our silence about them was meant to keep everyone up-phase focused on our prime destination, *not* to relegate any of you to the status of mere steerage riders."

"But that's what it did!" Pask shouted. "Knowing we could go from this system to another, and maybe even from Tau Ceti to yet another one, would've eased our minds! It would've saved *me* a lot of anxiety!"

Pask looked around. Odenwald's explanation had quieted the bulk of the hall. Reluctantly, Pask sat down, and Bao moved up to the podium again to speak:

"Recent tests of the accelerators on *Annie Jump* and *Fritz Zwicky* confirm their reliability. Tau Ceti is closer to Eppie than Eppie is to Sol. We can accomplish the trip without undue emotional stress or physical hardship—in about half the time it took to come here. I have nothing else to add unless some of you have technical inquiries that would fall within my areas of expertise."

"Wonderful!" someone not far from me shouted—Thorn Koon, I think. "A mere half century!"

"Ursidormizine slumber will turn that half century into a sleep and a forgetting," Bao said smoothly.

Too smoothly, I'm afraid.

The med techs responsible for maintaining the bioracks and their monitoring systems had seats on a catwalk to Bao's left; a dozen of them stood up and booed. Several other maintenance specialists—down on the floor with Lily, Dean, and me—joined the med techs in jeering Bao's proposal.

"*Booooo! Booooo!*" The auditorium echoed with this ugly rumbling. A few people began to stamp their feet.

"It's Bao, not Boo," Bao told us. "You're using the wrong diphthong."

Not many of Bao's auditors—if you could call them that—caught this witticism. In fact, the booing and foot-stamping got louder. Here and there throughout the hall, people stood to voice their dissent, if not their outrage.

When the woman in front of me rose, Dean struggled out of my lap and held himself upright with his feet on my thighs. I could no longer see the podium.

"*Quiet!*" I heard Odenwald's amplified voice say. "*Resume your seats!*"

In the face of this esteemed authority, the mutiny more or less ended. Silence settled. People sat back down. Tension, however, left an inaudible buzz in the air; and if Pask or some other aggrieved renegade chose to challenge Odenwald, I feared that chaos—out-and-out insurrection—would erupt in full and undefeatable cry.

Meanwhile, Dean continued to balance himself erect on my thighs. When I tried to tug him back down, he seized the chair back in front with one hand and, with the other, fended off my frustrated tugging.

"*Bao!*" Dean shouted into the silence. "*Bao! Bao! Bao!*" He pistoned his right arm, an emphatic machine, up and down. "*Bao! Bao! Bao!*"

At the mike again, Bao said, "Of all the learned people in this gathering today, only young Gwiazda seems to know how to pronounce my name. Thank you, Dean."

"*Bao!*" Dean shouted again. "Bao, holy crow, you are really welcome!" Then eased back into my lap.

A ripple of applause and a drizzle of cheers boomed into a tidal swell of acclamation. Singlehandedly, so to speak, Dean had scotched any threat of mayhem.

Lily rolled her eyes at me. She patted Dean on the leg. Under her breath, she murmured, "Way to go, Tiny Tim. And God bless us, every one."

Bao had control of the meeting again. He pointed out that even if we moved *Annie* ten times closer to Eppie than New Home orbited—to make use of the energy generated by the solar cells affixed to the hydrogen tanks covering our fuel wheel—we would still require about eighty-five days to create a single ton of antihydrogen. Given *Annie's* overall weight and the speeds that we had to achieve to complete our journey to Tau Ceti in fifty years, it would take another half century, up front, to concoct the tons of antimatter necessary for our trip.

If Bao had given us this news a moment ago, an all-out riot would have broken out. As it was, we began to hear hostile—if not downright bloody—murmurings again.

Greta Agostos stood up. "That puts us back to where we were when we left Earth—a century away from our destination! Possibly more!"

"If I could lessen the time and energy requirements," Bao said, "believe me, I would. But some things are givens. You either deal with them or pitch an infantile tantrum. I would strongly urge the former."

"Amen," said Milo Pask. "Amen." And his consent, after the outrage he'd so angrily voiced, seemed to bring a rational truce upon the convocation.

Odenwald took over good-naturedly from Bao, secret-keeper par excellence, and let it be known that Commander Roosenno and he favored a plan whereby *Fritz Zwicky* stayed in orbit around New Home until it became habitable again and *Annie Jump* went on to the Tau Ceti system. However, within certain well-defined parameters, they would permit personnel exchanges between our ships: the trade-offs mustn't drastically unbalance the skills available to either the would-be colonists or the interstellar voyagers. Whatever we did, long stretches of ursidormizine slumber lay ahead of us, as did a host of catch-as-catch-can repairs. Our wheelships, after all, were *old*. On Earth, we'd regard them as antiques.

"But the plan favored by Commander Roosenno and me isn't a *fait accompli*," Odenwald said. "I called you here to vote on, not merely to endorse, it, and I trust you to discuss and pass on the question like intelligent adults."

I squeezed Dean's leg and whispered to Lily, "Do our less than genius kids get a vote too?"

"Ask him," Lily said *sotto voce*.

But before I could, Kaz had risen to his feet. "Sir, why don't we return to Earth—not just *Annie Jump*, but *Fritz Zwicky* too? Tau Ceti may well lack a colonizable planet, and New Home may never recover from its asteroid strike."

"Are you making a motion that we return to Earth?"

"No, sir. I'm putting it forward as an option worthy of debate. The Sol system bred and gave us birth. Neither Tau Ceti nor Epsilon Eridani can say as much, and some of us now have children. Who wishes to doom them to death in an alien star system with no provision for basic human needs—food, air, water, a sense of belonging?"

Kaz sat down, and we debated the matter. Few wanted to return to Earth. In a quick poll, even our children rejected that option. We had fled Earth to explore, to claim new and rejuvenating territories for our species, not to bail out when that very enterprise—as we had known it would do and so had tried to anticipate—threw obstacles in our way. Besides, we all owed the universe a death, and better to pay up seeking a fruitful tomorrow than retreating to a polluted cradle.

When Odenwald actually called the vote, less than a hundred people selected the return-to-Earth option. Not even Kaz voted for it. He had raised the question with an eye on the future of the innocents born in transit to New Home, and I respected his love and scrupulosity in this. He had completely overcome his early bias against Dean.

After that, the final vote was easy. *Annie Jump Cannon's* personnel overwhelmingly approved Commander Odenwald's plan to resupply ourselves with antihydrogen ice and then to set out for Tau Ceti. A gathering like ours on *Fritz Zwicky* approved Roosenno's plan to remain in orbit, waiting out the dust storm and the greenhouse effect on New Home. If we were all equally lucky, *Annie* would leave for Tau Ceti about the time those on *Zwicky* ventured to the surface for the initial steps of their colony planting.

"*Hooray!*" cried Dean, clapping, when Odenwald announced the results of our vote. "*Bao! Bao! Bao!*"

At the end of this same meeting, Odenwald congratulated us not only on our decisions, but also on having participated in humanity's first successful venture to another solar system. Whatever happens to us in the coming weeks, months, and years, we have made history, and no one can take that achievement away from us.

"So Commander Roosenno and I agree that we should *celebrate* our arrival here," Odenwald told us. "We therefore decree a three-day festival, to begin officially at 0800 hours the day after tomorrow."

And so it has happened—namely, an alternately solemn and gala commemoration of what we've done, featuring personnel exchange between our wheelships and continuous ship-to-ship TV broadcasts. Our revelries have included song-fests, skits, mess parties, musical competitions, art shows, vidouts, seminars, and, most important to me, poetry head-to-heads.

Thich Ngoc Bao on *Annie Jump* and Bashemath Arbib on *Fritz Zwicky* organized competitions in the writing of ballads, odes, sonnets, sestinas, and haiku, among other forms, and required contestants to use different astrophysical phenomena as their poems' subjects or controlling metaphors.

Inevitably, Ghulam Sharif and I found ourselves squared off in three categories, the most amusing a haiku-writing contest. We wrote in our cubicles aboard our own ships, but the finished poems flashed onto toadstool units everywhere as well as onto the huge softscreens in our A-Tower auditoriums.

In her broadcast introduction, Arbib explained, "In its classical form, the Japanese haiku evokes a season. So each contestant must write four poems, using astrophysical phenomena for their primary metaphors. . . ."

Ghulam and I had ten minutes for each haiku, after which we screened them simultaneously (despite their staggered display here), on penalty of disqualification. Their progression ran winter, spring, summer, fall:

Sharif

*Interstellar planet
ice glistens in star-lit dark:
does it dream of spring?*

*Hydrogen ions
chirp and twitter microwaves
making nests: the stars*

*Swelling blue-white star
outshines the bright galaxy
spraying iron, salt: us*

*Hoard scant hydrogen
against the final darkness:
stars, like leaves, turn red*

Gwiazda

*Each vast aggregate
glitters, a many-armed flake:
beautiful, unique*

*Plasma stirs and jets:
a furnace catalyzer
in cold birth-throe depths*

*Warm fireflies float
amid the midnight showers:
blaze and drop, then gone*

*A jack o'lantern
Hisses on its black sky loam:
baleful, squat, too red*

I leave to you the discovery of the astrophysical concepts used metaphorically in each haiku, but note that both sequences conclude with the word *red* as a combination of coincidence and contest design.

Three hundred persons—from *Zwicky*, a like number from *Annie*—selected the winning sequence in a blind electronic vote, Sharif triumphing 167 to 132. (Attribute the lost vote to an abstainer who adjudged both sequences "insufficiently imaginative" to bother choosing.) But I take some consolation from the fact that, in a separate vote, my haiku for summer was the overall favorite.

And then Epsilon Eridani Days, an entertaining success in nearly every way, concluded.

Once again, every member of our great expedition must face the realities of our present circumstances

and the obligations of our choices.

Among my friends and acquaintances, Milo Pask, Etsuko Endo, Indira Sescharchari, Masoud Nadeq, and my arkboard lover, Lily Aliosi-Stark, have chosen to transfer to Roosenno's ark to wait for the dust cloud from Epimenides to settle. The defection that stings most painfully, of course, is the last.

"Abel, I've been down-phase in umpity-ump extended comas here on *Annie*," Lily told me a few hours ago. "I could handle another U-nap or two, but after I come up-phase again, I want to *stay* up-phase. I want to get on with my life. Is that so selfish a wish?"

"No more than my own," I said. "What about Dean?"

"We made him together, Abel, but he's yours. You have his life in your hands—insofar as *any* of us has control out here—and I expect you to do right by him."

"He's going with me."

"Of course he is. Nothing else makes sense. But I still expect you to do right by him."

"I won't let him forget you."

"That's one right thing you can try, but sooner or later he'll forget. Don't *force* him to remember. I won't mind if I'm just a nagging piece of grit in his memory. Eventually, if he has you to count on, that's all I should be."

"What crap," I said. "You sound like Joan of Arc praying amidst the flames."

For an instant, Lily's gaze darkened. Then she began to laugh. "I do, don't I? Well, good for me."

Using Colombo tethers and transfer dinghies, those leaving *Annie* carried their bodies across to *Zwicky*, sundering their souls from ours. But before these leavetakings, we took our melancholy last farewells. Dean, Kaz, and I met with Lily at the G-Tower docking station.

"It's like you guys're dying," Lily told us. "I'll never see you—any of you—again."

I kissed Lily. Hard. I kissed her again, caressing her hair. When I let go, Dean—DeBoy, as Lily had always called him—clung to her like a sorrowful young orang. If Kaz had not distracted him, she would have probably had to have emergency surgery to pry him loose.

Later, I watched from the G-Tower observatory as Lily and the others made their slow-motion glides across to or over from *Zwicky*. It seemed to me, though, that the dinghy containing my lover drew across the dark with it, in a harness of fireflies, a vein from my own clamoring heart.

A delusion, of course; a trick of the vacuum.

Nonetheless, it made me remember a haiku that Ghulam Sharif had written in the wake of our contest and sent over to me with a friend as a parting gift:

*Iron
cinders
of
stars
cool
in
expanding
darkness
:
too
late
for
regrets*

"Guh-bye!" cried Dean, one hand on the viewport. "Guh-bye, Mama!"

Odenwald had okayed Dean's presence upstairs, and as his dotting goduncle, Kaz had carried him up—for, under the present circumstances, kids had plenty of business in the observatory. Plenty.

"Guh-bye, guh-bye! Holy crow!"

Without Lily bodily before him, DeBoy truly understood only that *Annie Jump Cannon* was going on another long trip and that he was going with.

—with thanks to *Geoffrey A. Landis*