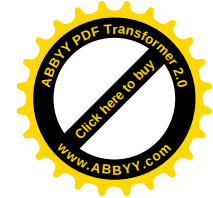
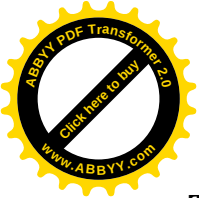


ON THE ORION LINE

Stephen Baxter



The Brief Life Burns Brightly broke out of the fleet. We were chasing down a Ghost cruiser, and we were closing.

The lifedome of the Brightly was transparent, so it was as if Captain Teid in her big chair, and her officers and their equipment clusters—and a few low-grade tars like me—were just floating in space. The light was subtle, coming from a nearby cluster of hot young stars, and from the rivers of sparking lights that made up the fleet formation we had just left, and beyond that from the sparking of novae. This was the Orion Line—six thousand light years from Earth and a thousand lights long, a front that spread right along the inner edge of the Orion Spiral Arm—and the stellar explosions marked battles that must have concluded years ago.

And, not a handful of clicks away, the Ghost cruiser slid across space, running for home. The cruiser was a rough egg-shape of silvered rope. Hundreds of Ghosts clung to the rope. You could see them slithering this way and that, not affected at all by the emptiness around them.

The Ghosts' destination was a small, old yellow star. Pael, our tame Academician, had identified it as a fortress star from some kind of strangeness in its light. But up close you don't need to be an Academician to spot a fortress. From the Brightly I could see with my unaided eyes that the star had a pale blue cage around it—an open lattice with struts half a million kilometers long—thrown there by the Ghosts, for their own purposes.

I had a lot of time to watch all this. I was just a tar. I was fifteen years old.

My duties at that moment were non-specific. I was supposed to stand to, and render assistance any way that was required—most likely with basic medical attention should we go into combat. Right now the only one of us tars actually working was Halle, who was chasing down a pool of vomit sicked up by Pael, the Academician, the only non-Navy personnel on the bridge.

The action on the Brightly wasn't like you see in Virtual shows. The atmosphere was calm, quiet, competent. All you could hear was the murmur of voices, from the crew and the equipment, and the hiss of recycling air. No drama: it was like an operating theater.

There was a soft warning chime.

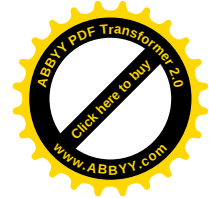
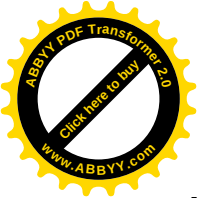
The captain raised an arm and called over Academician Pael, First Officer Till, and Jeru, the commissary assigned to the ship. They huddled close, conferring—apparently arguing. I saw the way flickering nova light reflected from Jeru's shaven head.

I felt my heart beat harder.

Everybody knew what the chime meant: that we were approaching the fortress cordon. Either we would break off, or we would chase the Ghost cruiser inside its invisible fortress. And everybody knew that no Navy ship that had ever penetrated a fortress cordon, ten light-minutes from the central star, had come back out again.

One way or the other, it would all be resolved soon.

Captain Teid cut short the debate. She leaned forward and addressed the crew. Her voice, cast through the ship, was friendly, like a cadre leader whispering in your ear. « You can all see we can't catch that swarm of Ghosts this side of the cordon. And you all know the hazard of crossing a cordon. But if we're ever going to break this blockade of theirs we have



to find a way to bust open those forts. So we're going in anyhow. Stand by your stations. »

There was a half-hearted cheer.

I caught Halle's eye. She grinned at me. She pointed at the captain, closed her fist and made a pumping movement. I admired her sentiment but she wasn't being too accurate, anatomically speaking, so I raised my middle finger and jiggled it back and forth.

It took a slap on the back of the head from Jeru, the commissary, to put a stop to that. « Little morons, » she growled.

« Sorry, sir—»

I got another slap for the apology. Jeru was a tall, stocky woman, dressed in the bland monastic robes said to date from the time of the founding of the Commission for Historical Truth a thousand years ago. But rumor was she'd seen plenty of combat action of her own before joining the Commission, and such was her physical strength and speed of reflex I could well believe it.

As we neared the cordon the Academician, Pael, started a gloomy countdown. The slow geometry of Ghost cruiser and tinsel-wrapped fortress star swiveled across the crowded sky.

Everybody went quiet.

The darkest time is always just before the action starts. Even if you can see or hear what is going on, all you do is think. What was going to happen to us when we crossed that intangible border? Would a fleet of Ghost ships materialize all around us? Would some mysterious weapon simply blast us out of the sky?

I caught the eye of First Officer Till. He was a veteran of twenty years; his scalp had been burned away in some ancient close-run combat, long before I was born, and he wore a crown of scar tissue with pride.

« Let's do it, tar, » he growled.

All the fear went away. I was overwhelmed by a feeling of togetherness, of us all being in this crap together. I had no thought of dying. Just: let's get through this.

« Yes, sir! »

Pael finished his countdown.

All the lights went out. Detonating stars wheeled.

And the ship exploded.

I was thrown into darkness. Air howled. Emergency bulkheads scythed past me, and I could hear people scream.

I slammed into the curving hull, nose pressed against the stars.

I bounced off and drifted. The inertial suspension was out, then. I thought I could smell blood—probably my own.

I could see the Ghost ship, a tangle of rope and silver baubles, tingling with highlights from the fortress star. We were still closing.

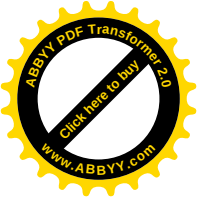
But I could also see shards of shattered lifedome, a sputtering drive unit. The shards were bits of the Brightly. It had gone, all gone, in a fraction of a second.

« Let's do it, » I murmured.

Maybe I was out of it for a while.

Somebody grabbed my ankle and tugged me down. There was a competent slap on my cheek, enough to make me focus.

« Case. Can you hear me? »



It was First Officer Till. Even in the swimming starlight that burned-off scalp was unmistakable.

I glanced around. There were four of us here: Till, Commissary Jeru, Academician Pael, me. We were huddled up against what looked like the stump of the First Officer's console. I realized that the gale of venting air had stopped. I was back inside a hull with integrity, then—

« Case! »

« I—yes, sir. »

« Report. »

I touched my lip; my hand came away bloody. At a time like that it's your duty to report your injuries, honestly and fully. Nobody needs a hero who turns out not to be able to function. « I think I'm all right. I may have a concussion. »

« Good enough. Strap down. » Till handed me a length of rope.

I saw that the others had tied themselves to struts. I did the same.

Till, with practiced ease, swam away into the air, I guessed looking for other survivors.

Academician Pael was trying to curl into a ball. He couldn't even speak. The tears just rolled out of his eyes. I stared at the way big globules welled up and drifted away into the air, glimmering.

The action had been over in seconds. All a bit sudden for an earthworm, I guess.

Nearby, I saw, trapped under one of the emergency bulkheads, there was a pair of legs—just that. The rest of the body must have been chopped away, gone drifting off with the rest of the debris from Brightly. But I recognized those legs, from a garish pink stripe on the sole of the right boot. That had been Halle. She was the only girl I had ever screwed, I thought—and more than likely, given the situation, the only girl I ever would get to screw.

I couldn't figure out how I felt about that.

Jeru was watching me. « Tar—do you think we should all be frightened for ourselves, like the Academician? » Her accent was strong, unidentifiable.

« No, sir. »

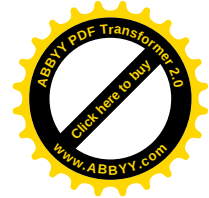
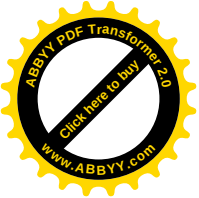
« No. » Jeru studied Pael with contempt. « We are in a yacht, Academician. Something has happened to the Brightly. The 'dome was designed to break up into yachts like this. » She sniffed. « We have air, and it isn't foul yet. » She winked at me. « Maybe we can do a little damage to the Ghosts before we die, tar. What do you think? »

I grinned. « Yes, sir. »

Pael lifted his head and stared at me with salt water eyes. « Lethe. You people are monsters. » His accent was gentle, a lilt. « Even such a child as this. You embrace death—«

Jeru grabbed Pael's jaw in a massive hand, and pinched the joint until he squealed. « Captain Teid grabbed you, Academician; she threw you here, into the yacht, before the bulkhead came down. I saw it. If she hadn't taken the time to do that, she would have made it herself. Was she a monster? Did she embrace death? » And she pushed Pael's face away.

For some reason I hadn't thought about the rest of the crew until that moment. I guess I have a limited imagination. Now, I felt adrift. The captain—dead?



I said, « Excuse me, Commissary. How many other yachts got out? »
« None, » she said steadily, making sure I had no illusions. « Just this one. They died doing their duty, tar. Like the captain. »

Of course she was right, and I felt a little better. Whatever his character, Pael was too valuable not to save. As for me, I had survived through sheer blind chance, through being in the right place when the walls came down: if the captain had been close, her duty would have been to pull me out of the way and take my place. It isn't a question of human values but of economics: a lot more is invested in the training and experience of a Captain Teid—or a Pael—than in me.

But Pael seemed more confused than I was.

First Officer Till came bustling back with a heap of equipment. « Put these on. » He handed out pressure suits. They were what we called slime suits in training: lightweight skinsuits, running off a backpack of gen-enged algae. « Move it, » said Till. « Impact with the Ghost cruiser in four minutes. We don't have any power; there's nothing we can do but ride it out. »

I crammed my legs into my suit.

Jeru complied, stripping off her robe to reveal a hard, scarred body. But she was frowning. « Why not heavier armor? »

For answer, Till picked out a gravity-wave handgun from the gear he had retrieved. Without pausing he held it to Pael's head and pushed the fire button.

Pael twitched.

Till said, « See? Nothing is working. Nothing but bio systems, it seems. » He threw the gun aside.

Pael closed his eyes, breathing hard.

Till said to me, « Test your comms. »

I closed up my hood and faceplate and began intoning, « One, two, three . . . » I could hear nothing.

Till began tapping at our backpacks, resetting the systems. His hood started to glow with transient, pale blue symbols. And then, scratchily, his voice started to come through. « . . . Five, six, seven—can you hear me, tar? »

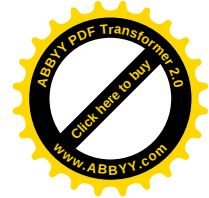
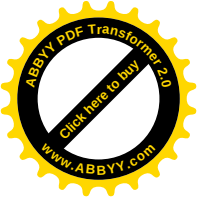
« Yes, sir. »

The symbols were bioluminescent. There were receptors on all our suits—photoreceptors, simple eyes—which could « read » the messages scrawled on our companions' suits. It was a backup system meant for use in environments where anything higher-tech would be a liability. But obviously it would only work as long as we were in line of sight.

« That will make life harder, » Jeru said. Oddly, mediated by software, she was easier to understand.

Till shrugged. « You take it as it comes. » Briskly, he began to hand out more gear. « These are basic field belt kits. There's some medical stuff: a suture kit, scalpel blades, blood-giving sets. You wear these syrettes around your neck, Academician. They contain painkillers, various gen-enged med-viruses . . . no, you wear it outside your suit, Pael, so you can reach it. You'll find valve inlets here, on your sleeve, and here, on the leg. » Now came weapons. « We should carry handguns, just in case they start working, but be ready with these. » He handed out combat knives.

Pael shrank back.



« Take the knife, Academician. You can shave off that ugly beard, if nothing else. »

I laughed out loud, and was rewarded with a wink from Till.

I took a knife. It was a heavy chunk of steel, solid and reassuring. I tucked it in my belt. I was starting to feel a whole lot better.

« Two minutes to impact, » Jeru said. I didn't have a working chronometer; she must have been counting the seconds.

« Seal up. » Till began to check the integrity of Pael's suit; Jeru and I helped each other. Face seal, glove seal, boot seal, pressure check. Water check, oh-two flow, cee-oh-two scrub . . .

When we were sealed I risked poking my head above Till's chair.

The Ghost ship filled space. The craft was kilometers across, big enough to have dwarfed the poor, doomed Brief Life Burns Brightly. It was a tangle of silvery rope of depthless complexity, occluding the stars and the warring fleets. Bulky equipment pods were suspended in the tangle.

And everywhere there were Silver Ghosts, sliding like beads of mercury. I could see how the yacht's emergency lights were returning crimson highlights from the featureless hides of Ghosts, so they looked like sprays of blood droplets across that shining perfection.

« Ten seconds, » Till called. « Brace. »

Suddenly silver ropes thick as tree trunks were all around us, looming out of the sky.

And we were thrown into chaos again.

I heard a grind of twisted metal, a scream of air. The hull popped open like an eggshell. The last of our air fled in a gush of ice crystals, and the only sound I could hear was my own breathing.

The crumpling hull soaked up some of our momentum.

But then the base of the yacht hit, and it hit hard.

The chair was wrenched out of my grasp, and I was hurled upward. There was a sudden pain in my left arm. I couldn't help but cry out.

I reached the limit of my tether and rebounded. The jolt sent further waves of pain through my arm. From up there, I could see the others were clustered around the base of the First Officer's chair, which had collapsed.

I looked up. We had stuck like a dart in the outer layers of the Ghost ship. There were shining threads arcing all around us, as if a huge net had scooped us up.

Jeru grabbed me and pulled me down. She jarred my bad arm, and I winced. But she ignored me, and went back to working on Till. He was under the fallen chair.

Pael started to take a syrette of dope from the sachet around his neck.

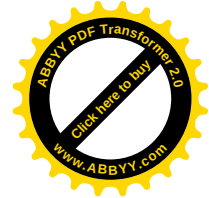
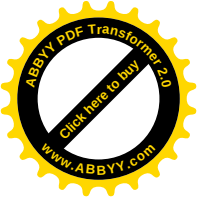
Jeru knocked his hand away. « You always use the casualty's, » she hissed. « Never your own. »

Pael looked hurt, rebuffed. « Why? »

I could answer that. « Because the chances are you'll need your own in a minute. »

Jeru stabbed a syrette into Till's arm.

Pael was staring at me through his faceplate with wide, frightened eyes. « You've broken your arm. »



Looking closely at the arm for the first time, I saw that it was bent back at an impossible angle. I couldn't believe it, even through the pain. I'd never bust so much as a finger, all the way through training.

Now Till jerked, a kind of miniature convulsion, and a big bubble of spit and blood blew out of his lips. Then the bubble popped, and his limbs went loose.

Jeru sat back, breathing hard. She said, « Okay. Okay. How did he put it?—You take it as it comes. » She looked around, at me, Pael. I could see she was trembling, which scared me. She said, « Now we move. We have to find an LUP. A lying-up point, Academician. A place to hole up. »

I said, « The First Officer—«

« Is dead. » She glanced at Pael. « Now it's just the three of us. We won't be able to avoid each other any more, Pael. »

Pael stared back, eyes empty.

Jeru looked at me, and for a second her expression softened. « A broken neck. Till broke his neck, tar. »

Another death, just like that: just for a heartbeat that was too much for me.

Jeru said briskly, « Do your duty, tar. Help the worm. »

I snapped back. « Yes, sir. » I grabbed Pael's unresisting arm.

Led by Jeru, we began to move, the three of us, away from the crumpled wreck of our yacht, deep into the alien tangle of a Silver Ghost cruiser.

We found our LUP.

It was just a hollow in a somewhat denser tangle of silvery ropes, but it afforded us some cover, and it seemed to be away from the main concentration of Ghosts. We were still open to the vacuum—as the whole cruiser seemed to be—and I realized then that I wouldn't be getting out of this suit for a while.

As soon as we picked the LUP, Jeru made us take up positions in an all-round defense, covering a 360-degree arc.

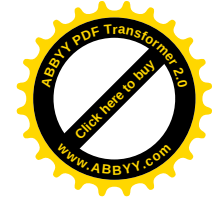
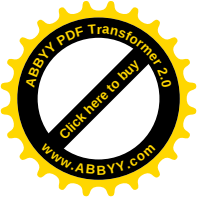
Then we did nothing, absolutely nothing, for ten minutes.

It was SOP, standard operating procedure, and I was impressed. You've just come out of all the chaos of the destruction of the Brightly and the crash of the yacht, a frenzy of activity. Now you have to give your body a chance to adjust to the new environment, to the sounds and smells and sights.

Only here, there was nothing to smell but my own sweat and piss, nothing to hear but my ragged breathing. And my arm was hurting like hell.

To occupy my mind I concentrated on getting my night vision working. Your eyes take a while to adjust to the darkness—forty-five minutes before they are fully effective—but you are already seeing better after five. I could see stars through the chinks in the wiry metallic brush around me, the flares of distant novae, and the reassuring lights of our fleet. But a Ghost ship is a dark place, a mess of shadows and smeared-out reflections. It was going to be easy to get spooked here.

When the ten minutes were done, Academician Pael started bleating, but Jeru ignored him and came straight over to me. She got hold of my busted arm and started to feel the bone. « So, » she said briskly. « What's your name, tar? »



« Case, sir. »

« What do you think of your new quarters? »

« Where do I eat? »

She grinned. « Turn off your comms, » she said.

I complied.

Without warning she pulled my arm, hard. I was glad she couldn't hear how I howled.

She pulled a canister out of her belt and squirted gunk over my arm; it was semi-sentient and snuggled into place, setting as a hard cast around my injury. When I was healed the cast would fall away of its own accord.

She motioned me to turn on my comms again, and held up a syrette.

« I don't need that. »

« Don't be brave, tar. It will help your bones knit. »

« Sir, there's a rumor that stuff makes you impotent. » I felt stupid even as I said it.

Jeru laughed out loud, and just grabbed my arm. « Anyhow it's the First Officer's, and he doesn't need it any more, does he? »

I couldn't argue with that; I accepted the injection. The pain started ebbing almost immediately.

Jeru pulled a tactical beacon out of her belt kit. It was a thumb-sized orange cylinder. « I'm going to try to signal the fleet. I'll work my way out of this tangle; even if the beacon is working we might be shielded in here. » Pael started to protest, but she shut him up. I sensed I had been thrown into the middle of an ongoing conflict between them. « Case, you're on stag. And show this worm what's in his kit. I'll come back the same way I go. All right? »

« Yes. » More SOP.

She slid away through silvery threads.

I lodged myself in the tangle and started to go through the stuff in the belt kits Till had fetched for us. There was water, rehydration salts, and compressed food, all to be delivered to spigots inside our sealed hoods. We had power packs the size of my thumbnail, but they were as dead as the rest of the kit. There was a lot of low-tech gear meant to prolong survival in a variety of situations, such as a magnetic compass, a heliograph, a thumb saw, a magnifying glass, pitons, and spindles of rope, even fishing line.

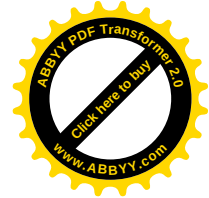
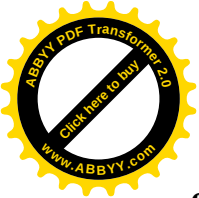
I had to show Pael how his suit functioned as a lavatory. The trick is just to let go; a slime suit recycles most of what you give it, and compresses the rest. That's not to say it's comfortable. I've never yet worn a suit that was good at absorbing odors. I bet no suit designer spent more than an hour in one of her own creations.

I felt fine.

The wreck, the hammer-blow deaths one after the other—none of it was far beneath the surface of my mind. But that's where it stayed, for now; as long as I had the next task to focus on, and the next after that, I could keep moving forward. The time to let it all hit you is after the show.

I guess Pael had never been trained like that.

He was a thin, spindly man, his eyes sunk in black shadow, and his ridiculous red beard was crammed up inside his faceplate. Now that the great crises were over, his energy seemed to have drained away, and his



functioning was slowing to a crawl. He looked almost comical as he pawed at his useless bits of kit.

After a time he said, « Case, is it? »

« Yes, sir. »

« Are you from Earth, child? »

« No. I—«

He ignored me. « The Academies are based on Earth. Did you know that, child? But they do admit a few off-worlders. »

I glimpsed a lifetime of outsider resentment. But I could care less. Also I wasn't a child. I asked cautiously, « Where are you from, sir? »

He sighed. « It's 51 Pegasi. I-B. »

I'd never heard of it. « What kind of place is that? Is it near Earth? »

« Is everything measured relative to Earth. . . ? Not very far. My home world was one of the first extra-solar planets to be discovered—or at least, the primary is. I grew up on a moon. The primary is a hot Jupiter. »

I knew what that meant: a giant planet huddled close to its parent star.

He looked up at me. « Where you grew up, could you see the sky? »

« No—«

« I could. And the sky was full of sails. That close to the sun, solar sails work efficiently, you see. I used to watch them at night, schooners with sails hundreds of kilometers wide, tacking this way and that in the light. But you can't see the sky from Earth—not from the Academy bunkers anyhow. »

« Then why did you go there? »

« I didn't have a choice. » He laughed, hollowly. « I was doomed by being smart. That is why your precious commissary despises me so much, you see. I have been taught to think—and we can't have that, can we. . . ? »

I turned away from him and shut up. Jeru wasn't « my » commissary, and this sure wasn't my argument. Besides, Pael gave me the creeps. I've always been wary of people who knew too much about science and technology. With a weapon, all you want to know is how it works, what kind of energy or ammunition it needs, and what to do when it goes wrong. People who know all the technical background and the statistics are usually covering up their own failings; it is experience of use that counts.

But this was no loudmouth weapons tech. This was an Academician: one of humanity's elite scientists. I felt I had no point of contact with him at all.

I looked out through the tangle, trying to see the fleet's sliding, glimmering lanes of light.

There was motion in the tangle. I turned that way, motioning Pael to keep still and silent, and got hold of my knife in my good hand.

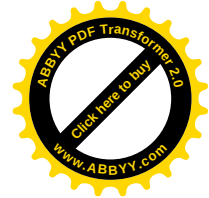
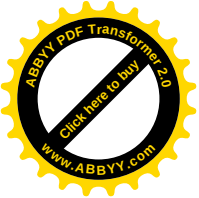
Jeru came bustling back, exactly the way she had left. She nodded approvingly at my alertness. « Not a peep out of the beacon. »

Pael said, « You realize our time here is limited. »

I asked, « The suits? »

« He means the star, » Jeru said heavily. « Case, fortress stars seem to be unstable. When the Ghosts throw up their cordon, the stars don't last long before going pop. »

Pael shrugged. « We have hours, a few days at most. »



Jeru said, « Well, we're going to have to get out, beyond the fortress cordon, so we can signal the fleet. That or find a way to collapse the cordon altogether. »

Pael laughed hollowly. « And how do you propose we do that? »

Jeru glared. « Isn't it your role to tell me, Academician? »

Pael leaned back and closed his eyes. « Not for the first time, you're being ridiculous. »

Jeru growled. She turned to me. « You. What do you know about the Ghosts? »

I said, « They come from someplace cold. That's why they are wrapped up in silvery shells. You can't bring a Ghost down with laser fire because of those shells. They're perfectly reflective. »

Pael said, « Not perfectly. They are based on a Planck-zero effect. . . . About one part in a billion of incident energy is absorbed. »

I hesitated. « They say the Ghosts experiment on people. »

Pael sneered. « Lies put about by your Commission for Historical Truth, Commissary. To demonize an opponent is a tactic as old as mankind. »

Jeru wasn't perturbed. « Then why don't you put young Case right? How do the Ghosts go about their business? »

Pael said, « The Silver Ghosts tinker with the laws of physics. »

I looked to Jeru; she shrugged.

Pael tried to explain. It was all to do with quagma.

Quagma is the state of matter that emerged from the Big Bang. Matter, when raised to sufficiently high temperatures, melts into a magma of quarks—a quagma. And at such temperatures the four fundamental forces of physics unify into a single superforce. When quagma is allowed to cool and expand its binding superforce decomposes into four sub-forces.

To my surprise, I understood some of this. The principle of the GUTdrive, which powers intrasystem ships like Brief Life Burns Brightly, is related.

Anyhow, by controlling the superforce decomposition, you can select the ratio between those forces. And those ratios govern the fundamental constants of physics.

Something like that.

Pael said, « That marvelous reflective coating of theirs is an example. Each Ghost is surrounded by a thin layer of space in which a fundamental number called the Planck constant is significantly lower than elsewhere. Thus, quantum effects are collapsed . . . because the energy carried by a photon, a particle of light, is proportional to the Planck constant, an incoming photon must shed most of its energy when it hits the shell—hence the reflectivity. »

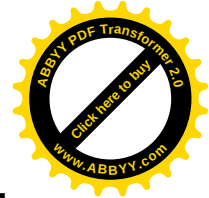
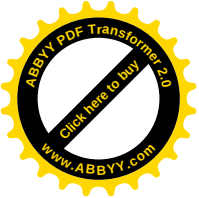
« All right, » Jeru said. « So what are they doing here? »

Pael sighed. « The fortress star seems to be surrounded by an open shell of quagma and exotic matter. We surmise that the Ghosts have blown a bubble around each star, a space-time volume in which the laws of physics are—tweaked. »

« And that's why our equipment failed. »

« Presumably, » said Pael, with cold sarcasm.

I asked, « What do the Ghosts want? Why do they do all this stuff? »



Pael studied me. « You are trained to kill them, and they don't even tell you that? »

Jeru just glowered.

Pael said, « The Ghosts were not shaped by competitive evolution. They are symbiotic creatures; they derive from life forms that huddled into cooperative collectives as their world turned cold. And they seem to be motivated—not by expansion and the acquisition of territory for its own sake, as we are—but by a desire to understand the fine-tuning of the universe. Why are we here? You see, young tar, there is only a narrow range of the constants of physics within which life of any sort is possible. We think the Ghosts are studying this question by pushing at the boundaries—by tinkering with the laws that sustain and contain us all. »

Jeru said, « An enemy who can deploy the laws of physics as a weapon is formidable. But in the long run, we will out-compete the Ghosts. »

Pael said bleakly, « Ah, the evolutionary destiny of mankind. How dismal. But we lived in peace with the Ghosts, under the Raoul Accords, for a thousand years. We are so different, with disparate motivations—why should there be a clash, any more than between two species of birds in the same garden? »

I'd never seen birds, or a garden, so that passed me by.

Jeru just glared. She said at last, « Let's return to practicalities. How do their fortresses work? » When Pael didn't reply, she snapped, « Academician, you've been inside a fortress cordon for an hour already and you haven't made a single fresh observation? »

Acidly, Pael demanded, « What would you have me do? »

Jeru nodded at me. « What have you seen, tar? »

« Our instruments and weapons don't work, » I said promptly. « The Brightly exploded. I broke my arm. »

Jeru said, « Till snapped his neck also. » She flexed her hand within her glove. « What would make our bones more brittle? Anything else? »

I shrugged.

Pael admitted, « I do feel somewhat warm. »

Jeru asked, « Could these body changes be relevant? »

« I don't see how. »

« Then figure it out. »

« I have no equipment. »

Jeru dumped spare gear—weapons, beacons—in his lap. « You have your eyes, your hands and your mind. Improvise. » She turned to me. « As for you, tar, let's do a little infil. We still need to find a way off this scow. »

I glanced doubtfully at Pael. « There's nobody to stand on stag. »

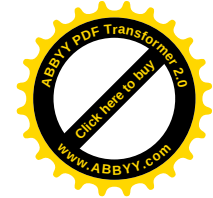
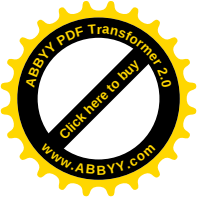
Jeru said, « I know. But there are only three of us. » She grasped Pael's shoulder, hard. « Keep your eyes open, Academician. We'll come back the same way we left. So you'll know it's us. Do you understand? »

Pael shrugged her away, focusing on the gadgets on his lap.

I looked at him doubtfully. It seemed to me a whole platoon of Ghosts could have come down on him without his even noticing. But Jeru was right; there was nothing more we could do.

She studied me, fingered my arm. « You up to this? »

« I'm fine, sir. »



« You are lucky. A good war comes along once in a lifetime. And this is your war, tar. »

That sounded like parade-ground pep talk, and I responded in kind.

« Can I have your rations, sir? You won't be needing them soon. » I mimed digging a grave.

She grinned back fiercely. « Yeah. When your turn comes, slit your suit and let the farts out before I take it off your stiffening corpse—«

Pael's voice was trembling. « You really are monsters. »

I shared a glance with Jeru. But we shut up, for fear of upsetting the earthworm further.

I grasped my fighting knife, and we slid away into the dark.

What we were hoping to find was some equivalent of a bridge. Even if we succeeded, I couldn't imagine what we'd do next. Anyhow, we had to try.

We slid through the tangle. Ghost cable stuff is tough, even to a knife blade. But it is reasonably flexible; you can just push it aside if you get stuck, although we tried to avoid doing that for fear of leaving a sign.

We used standard patrolling SOP, adapted for the circumstance. We would move for ten or fifteen minutes, clambering through the tangle, and then take a break for five minutes. I'd sip water—I was getting hot—and maybe nibble on a glucose tab, check on my arm, and pull the suit around me to get comfortable again. It's the way to do it. If you just push yourself on and on you run down your reserves and end up in no fit state to achieve the goal anyhow.

And all the while I was trying to keep up my all-around awareness, protecting my dark adaptation, and making appreciations. How far away is Jeru? What if an attack comes from in front, behind, above, below, left or right? Where can I find cover?

I began to build up an impression of the Ghost cruiser. It was a rough egg-shape, a couple of kilometers long, and basically a mass of the anonymous silvery cable. There were chambers and platforms and instruments stuck as if at random into the tangle, like food fragments in an old man's beard. I guess it makes for a flexible, easily modified configuration. Where the tangle was a little less thick, I glimpsed a more substantial core, a cylinder running along the axis of the craft. Perhaps it was the drive unit. I wondered if it was functioning; perhaps the Ghost equipment was designed to adapt to the changed conditions inside the fortress cordon.

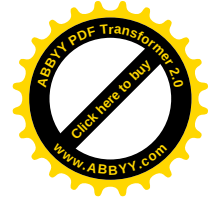
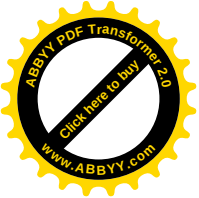
There were Ghosts all over the craft.

They drifted over and through the tangle, following pathways invisible to us. Or they would cluster in little knots on the tangle. We couldn't tell what they were doing or saying. To human eyes a Silver Ghost is just a silvery sphere, visible only by reflection like a hole cut out of space, and without specialist equipment it is impossible even to tell one from another.

We kept out of sight. But I was sure the Ghosts must have spotted us, or were at least tracking our movements. After all we'd crash-landed in their ship. But they made no overt moves toward us.

We reached the outer hull, the place the cabling ran out, and dug back into the tangle a little way to stay out of sight.

I got an unimpeded view of the stars.



Still those nova firecrackers went off all over the sky; still those young stars glared like lanterns. It seemed to me the fortress's central, enclosed star looked a little brighter, hotter than it had been. I made a mental note to report that to the Academician.

But the most striking sight was the fleet.

Over a volume light-months wide, countless craft slid silently across the sky. They were organized in a complex network of corridors filling three-dimensional space: rivers of light gushed this way and that, their different colors denoting different classes and sizes of vessel. And, here and there, denser knots of color and light sparked, irregular flares in the orderly flows. They were places where human ships were engaging the enemy, places where people were fighting and dying.

It was a magnificent sight. But it was a big, empty sky, and the nearest sun was that eerie dwarf enclosed in its spooky blue net, a long way away, and there was movement in three dimensions, above me, below me, all around me. . . .

I found the fingers of my good hand had locked themselves around a sliver of the tangle.

Jeru grabbed my wrist and shook my arm until I was able to let go. She kept hold of my arm, her eyes locked on mine. I have you. You won't fall. Then she pulled me into a dense knot of the tangle, shutting out the sky.

She huddled close to me, so the bio lights of our suits wouldn't show far. Her eyes were pale blue, like windows. « You aren't used to being outside, are you, tar? »

« I'm sorry, Commissary. I've been trained—«

« You're still human. We all have weak points. The trick is to know them and allow for them. Where are you from? »

I managed a grin. « Mercury. Caloris Planitia. » Mercury is a ball of iron at the bottom of the sun's gravity well. It is an iron mine, and an exotic matter factory, with a sun like a lid hanging over it. Most of the surface is given over to solar power collectors. It is a place of tunnels and warrens, where kids compete with the rats.

« And that's why you joined up? To get away? »

« I was drafted. »

« Come on, » she scoffed. « On a place like Mercury there are ways to hide. Are you a romantic, tar? You wanted to see the stars? »

« No, » I said bluntly. « Life is more useful here. »

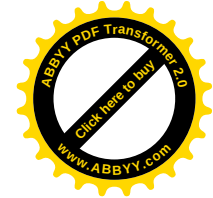
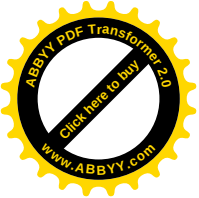
She studied me. « A brief life should burn brightly—eh, tar? »

« Yes, sir. »

« I came from Deneb, » she said. « Do you know it? »

« No. »

« Sixteen hundred light years from Earth—a system settled some four centuries after the start of the Third Expansion. It is quite different from the solar system. It is—organized. By the time the first ships reached Deneb, the mechanics of exploitation had become efficient. From preliminary exploration to working shipyards and daughter colonies in less than a century. . . . Deneb's resources—its planets and asteroids and comets, even the star itself—have been mined to fund fresh colonizing waves, the greater Expansion—and, of course, to support the war with the Ghosts. »



She swept her hand over the sky. « Think of it, tar. The Third Expansion: between here and Sol, across six thousand light years—nothing but mankind, the fruit of a thousand years of world-building. And all of it linked by economics. Older systems like Deneb, their resources spent—even the solar system itself—are supported by a flow of goods and materials inward from the growing periphery of the Expansion. There are trade lanes spanning thousands of light years, lanes that never leave human territory, plied by vast schooners kilometers wide. But now the Ghosts are in our way. And that’s what we’re fighting for! »

« Yes, sir. »

She eyed me. « You ready to go on? »

« Yes. »

We began to make our way forward again, just under the tangle, still following patrol SOP.

I was glad to be moving again. I’ve never been comfortable talking personally—and for sure not with a Commissary. But I suppose even Commissaries need to talk.

Jeru spotted a file of the Ghosts moving in a crocodile, like so many schoolchildren, toward the head of the ship. It was the most purposeful activity we’d seen so far, so we followed them.

After a couple of hundred meters the Ghosts began to duck down into the tangle, out of our sight. We followed them in.

Maybe fifty meters deep, we came to a large enclosed chamber, a smooth bean-shaped pod that would have been big enough to enclose our yacht. The surface appeared to be semi-transparent, perhaps designed to let in sunlight. I could see shadowy shapes moving within.

Ghosts were clustered around the pod’s hull, brushing its surface.

Jeru beckoned, and we worked our way through the tangle toward the far end of the pod, where the density of the Ghosts seemed to be lowest.

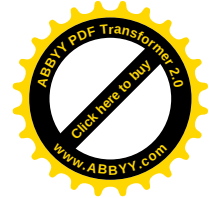
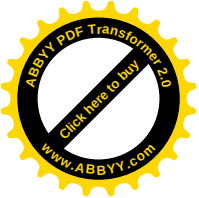
We slithered to the surface of the pod. There were sucker pads on our palms and toes to help us grip. We began crawling along the length of the pod, ducking flat when we saw Ghosts loom into view. It was like climbing over a glass ceiling.

The pod was pressurized. At one end of the pod a big ball of mud hung in the air, brown and viscous. It seemed to be heated from within; it was slowly boiling, with big sticky bubbles of vapor crowding its surface, and I saw how it was laced with purple and red smears. There is no convection in zero gravity, of course. Maybe the Ghosts were using pumps to drive the flow of vapor.

Tubes led off from the mud ball to the hull of the pod. Ghosts clustered there, sucking up the purple gunk from the mud.

We figured it out in bioluminescent « whispers. » The Ghosts were feeding. Their home world is too small to have retained much internal warmth, but, deep beneath their frozen oceans or in the dark of their rocks, a little primordial geotherm heat must leak out still, driving fountains of minerals dragged up from the depths. And, as at the bottom of Earth’s oceans, on those minerals and the slow leak of heat, life forms feed. And the Ghosts feed on them.

So this mud ball was a field kitchen. I peered down at purplish slime, a gourmet meal for Ghosts, and I didn’t envy them.



There was nothing for us here. Jeru beckoned me again, and we slithered further forward.

The next section of the pod was . . . strange.

It was a chamber full of sparkling, silvery saucer-shapes, like smaller, flattened-out Ghosts, perhaps. They fizzed through the air or crawled over each other or jammed themselves together into great wadded balls that would hold for a few seconds and then collapse, their component parts squirming off for some new adventure elsewhere. I could see there were feeding tubes on the walls, and one or two Ghosts drifted among the saucer things, like an adult in a yard of squabbling children.

There was a subtle shadow before me.

I looked up, and found myself staring at my own reflection—an angled head, an open mouth, a sprawled body—folded over, fish-eye style, just centimeters from my nose.

It was a Ghost. It bobbed massively before me.

I pushed myself away from the hull, slowly. I grabbed hold of the nearest tangle branch with my good hand. I knew I couldn't reach for my knife, which was tucked into my belt at my back. And I couldn't see Jeru anywhere. It might be that the Ghosts had taken her already. Either way I couldn't call her, or even look for her, for fear of giving her away.

The Ghost had a heavy-looking belt wrapped around its equator. I had to assume that those complex knots of equipment were weapons. Aside from its belt, the Ghost was quite featureless: it might have been stationary, or spinning at a hundred revolutions a minute. I stared at its hide, trying to understand that there was a layer in there like a separate universe, where the laws of physics had been tweaked. But all I could see was my own scared face looking back at me.

And then Jeru fell on the Ghost from above, limbs splayed, knives glinting in both hands. I could see she was yelling—mouth open, eyes wide—but she fell in utter silence, her comms disabled.

Flexing her body like a whip, she rammed both knives into the Ghost's hide—if I took that belt to be its equator, somewhere near its north pole. The Ghost pulsed, complex ripples chasing across its surface. But Jeru did a handstand and reached up with her legs to the tangle above, and anchored herself there.

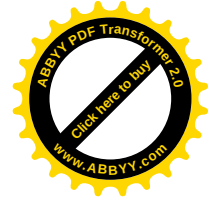
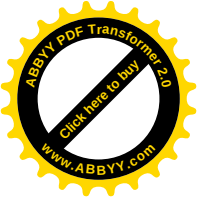
The Ghost began to spin, trying to throw Jeru off. But she held her grip on the tangle, and kept the knives thrust in its hide, and all the Ghost succeeded in doing was opening up twin gashes, right across its upper section. Steam pulsed out, and I glimpsed redness within.

For long seconds I just hung there, frozen.

You're trained to mount the proper reaction to an enemy assault. But it all vaporizes when you're faced with a ton of spinning, pulsing monster, and you're armed with nothing but a knife. You just want to make yourself as small as possible; maybe it will all go away. But in the end you know it won't, that something has to be done.

So I pulled out my own knife and launched myself at that north pole area.

I started to make cross-cuts between Jeru's gashes. Ghost skin is tough, like thick rubber, but easy to cut if you have the anchorage. Soon I had loosened flaps and lids of skin, and I started pulling them away, exposing a deep redness within. Steam gushed out, sparkling to ice.



Jeru let go of her perch and joined me. We clung with our fingers and hands to the gashes we'd made, and we cut and slashed and dug; though the Ghost spun crazily, it couldn't shake us loose. Soon we were hauling out great warm mounds of meat—ropes like entrails, pulsing slabs like a human's liver or heart. At first ice crystals spurted all around us, but as the Ghost lost the heat it had hoarded all its life, that thin wind died, and frost began to gather on the cut and torn flesh.

At last Jeru pushed my shoulder, and we both drifted away from the Ghost. It was still spinning, but I could see that the spin was nothing but dead momentum; the Ghost had lost its heat, and its life.

Jeru and I faced each other.

I said breathlessly, « I never heard of anyone in hand-to-hand with a Ghost before. »

« Neither did I. Lethe, » she said, inspecting her hand. « I think I cracked a finger. »

It wasn't funny. But Jeru stared at me, and I stared back, and then we both started to laugh, and our slime suits pulsed with pink and blue icons.

« He stood his ground, » I said.

« Yes. Maybe he thought we were threatening the nursery. »

« The place with the silver saucers? »

She looked at me quizzically. « Ghosts are symbiotes, tar. That looked to me like a nursery for Ghost hides. Independent entities. »

I had never thought of Ghosts having young. I had not thought of the Ghost we had killed as a mother protecting its young. I'm not a deep thinker now, and wasn't then; but it was not, for me, a comfortable thought.

But then Jeru started to move. « Come on, tar. Back to work. » She anchored her legs in the tangle and began to grab at the still-rotating Ghost carcass, trying to slow its spin.

I anchored likewise and began to help her. The Ghost was massive, the size of a major piece of machinery, and it had built up respectable momentum; at first I couldn't grab hold of the skin flaps that spun past my hand. As we labored I became aware I was getting uncomfortably hot. The light that seeped into the tangle from that caged sun seemed to be getting stronger by the minute.

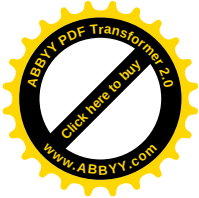
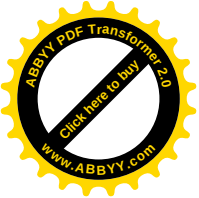
But as we worked those uneasy thoughts soon dissipated.

At last we got the Ghost under control. Briskly Jeru stripped it of its kit belt, and we began to cram the baggy corpse as deep as we could into the surrounding tangle. It was a grisly job. As the Ghost crumpled further, more of its innards, stiffening now, came pushing out of the holes we'd given it in its hide, and I had to keep from gagging as the foul stuff came pushing out into my face.

At last it was done—as best we could manage it, anyhow.

Jeru's faceplate was smeared with black and red. She was sweating hard, her face pink. But she was grinning, and she had a trophy, the Ghost belt around her shoulders. We began to make our way back, following the same SOP as before.

When we got back to our lying-up point, we found Academician Pael was in trouble.



Pael had curled up in a ball, his hands over his face. We pulled him open. His eyes were closed, his face blotched pink, and his faceplate dripped with condensation.

He was surrounded by gadgets stuck in the tangle—including parts from what looked like a broken-open starbreaker handgun; I recognized prisms and mirrors and diffraction gratings. Well, unless he woke up, he wouldn't be able to tell us what he had been doing here.

Jeru glanced around. The light of the fortress's central star had gotten a lot stronger. Our lying-up point was now bathed in light—and heat—with the surrounding tangle offering very little shelter. « Any ideas, tar? »

I felt the exhilaration of our infil drain away. « No, sir. »

Jeru's face, bathed in sweat, showed tension. I noticed she was favoring her left hand. She'd mentioned, back at the nursery pod, that she'd cracked a finger, but had said nothing about it since—nor did she give it any time now. « All right. » She dumped the Ghost equipment belt and took a deep draught of water from her hood spigot. « Tar, you're on stag. Try to keep Pael in the shade of your body. And if he wakes up, ask him what he's found out. »

« Yes, sir. »

« Good. »

And then she was gone, melting into the complex shadows of the tangle as if she'd been born to these conditions.

I found a place where I could keep up 360-degree vision, and offer a little of my shadow to Pael—not that I imagined it helped much.

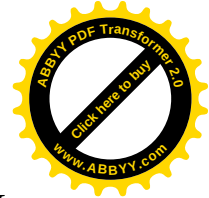
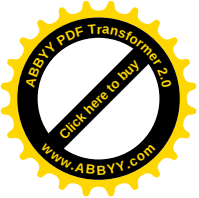
I had nothing to do but wait.

As the Ghost ship followed its own mysterious course, the light dapples that came filtering through the tangle shifted and evolved. Clinging to the tangle, I thought I could feel vibration: a slow, deep harmonization that pulsed through the ship's giant structure. I wondered if I was hearing the deep voices of Ghosts, calling to each other from one end of their mighty ship to another. It all served to remind me that everything in my environment, everything, was alien, and I was very far from home.

I tried to count my heartbeat, my breaths; I tried to figure out how long a second was. « A thousand and one. A thousand and two . . . » Keeping time is a basic human trait; time provides a basic orientation, and keeps you mentally sharp and in touch with reality. But I kept losing count.

And all my efforts failed to stop darker thoughts creeping into my head.

During a drama like the contact with the Ghost, you don't realize what's happening to you because your body blanks it out; on some level you know you just don't have time to deal with it. Now I had stopped moving, the aches and pains of the last few hours started crowding in on me. I was still sore in my head and back and, of course, my busted arm. I could feel deep bruises, maybe cuts, on my gloved hands where I had hauled at my knife, and I felt as if I had wrenched my good shoulder. One of my toes was throbbing ominously: I wondered if I had cracked another bone, here in this weird environment in which my skeleton had become as brittle as an old man's. I was chafed at my groin and armpits and knees and ankles and elbows, my skin rubbed raw. I was used to suits; normally I'm tougher than that.



The shafts of sunlight on my back were working on me too; it felt as if I was lying underneath the elements of an oven. I had a headache, a deep sick feeling in the pit of my stomach, a ringing in my ears, and a persistent ring of blackness around my eyes. Maybe I was just exhausted, dehydrated; maybe it was more than that.

I started to think back over my operation with Jeru, and the regrets began.

Okay, I'd stood my ground when confronted by the Ghost and not betrayed Jeru's position. But when she launched her attack I'd hesitated, for those crucial few seconds. Maybe if I'd been tougher the commissary wouldn't find herself hauling through the tangle, alone, with a busted finger distracting her with pain signals.

Our training is comprehensive. You're taught to expect that kind of hindsight torture, in the quiet moments, and to discount it—or, better yet, learn from it. But, effectively alone in that metallic alien forest, I wasn't finding my training was offering much perspective.

And, worse, I started to think ahead. Always a mistake.

I couldn't believe that the Academician and his reluctant gadgetry were going to achieve anything significant. And for all the excitement of our infil, we hadn't found anything resembling a bridge or any vulnerable point we could attack, and all we'd come back with was a belt of field kit we didn't even understand.

For the first time I began to consider seriously the possibility that I wasn't going to live through this—that I was going to die when my suit gave up or the sun went pop, whichever came first, in no more than a few hours.

A brief life burns brightly. That's what you're taught. Longevity makes you conservative, fearful, selfish. Humans made that mistake before, and we finished up a subject race. Live fast and furiously, for you aren't important—all that matters is what you can do for the species.

But I didn't want to die.

If I never returned to Mercury again I wouldn't shed a tear. But I had a life now, in the Navy. And then there were my buddies: the people I'd trained and served with, people like Halle—even Jeru. Having found fellowship for the first time in my life, I didn't want to lose it so quickly, and fall into the darkness alone—especially if it was to be for nothing.

But maybe I wasn't going to get a choice.

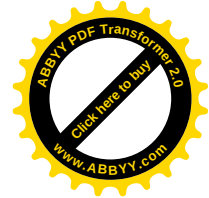
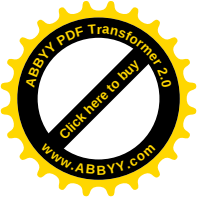
After an unmeasured time, Jeru returned. She was hauling a silvery blanket. It was Ghost hide. She started to shake it out.

I dropped down to help her. « You went back to the one we killed—«

« —and skinned him, » she said, breathless. « I just scraped off the crap with a knife. The Planck-zero layer peels away easily. And look . . . » she made a quick incision in the glimmering sheet with her knife. Then she put the two edges together again, ran her finger along the seam, and showed me the result. I couldn't even see where the cut had been. « Self-sealing, self-healing, » she said. « Remember that, tar. »

« Yes, sir. »

We started to rig the punctured, splayed-out hide as a rough canopy over our LUP, blocking as much of the sunlight as possible from Pael. A few slivers of frozen flesh still clung to the hide, but mostly it was like working with a fine, light metallic foil.



In the sudden shade, Pael was starting to stir. His moans were translated to stark bioluminescent icons.

« Help him, » Jeru snapped. « Make him drink. » And while I did that she dug into the med kit on her belt and started to spray cast material around the fingers of her left hand.

« It's the speed of light, » Pael said. He was huddled in a corner of our LUP, his legs tucked against his chest. His voice must have been feeble; the bioluminescent sigils on his suit were fragmentary and came with possible variants extrapolated by the translator software.

« Tell us, » Jeru said, relatively gently.

« The Ghosts have found a way to change lightspeed in this fortress. In fact to increase it. » He began talking again about quagma and physics constants and the rolled-up dimensions of spacetime, but Jeru waved that away irritably.

« How do you know this? »

Pael began tinkering with his prisms and gratings. « I took your advice, Commissary. » He beckoned to me. « Come see, child. »

I saw that a shaft of red light, split out and deflected by his prism, shone through a diffraction grating and cast an angular pattern of dots and lines on a scrap of smooth plastic behind.

« You see? » His eyes searched my face.

« I'm sorry, sir. »

« The wavelength of the light has changed. It has been increased. Red light should have a wavelength, oh, a fifth shorter than that indicated by this pattern. »

I was struggling to understand. I held up my hand. « Shouldn't the green of this glove turn yellow, or blue. . . ? »

Pael sighed. « No. Because the color you see depends, not on the wavelength of a photon, but on its energy. Conservation of energy still applies, even where the Ghosts are tinkering. So each photon carries as much energy as before—and evokes the same 'color.' Since a photon's energy is proportional to its frequency, that means frequencies are left unchanged. But since lightspeed is equal to frequency multiplied by wavelength, an increase in wavelength implies—«

« An increase in lightspeed, » said Jeru.

« Yes. »

I didn't follow much of that. I turned and looked up at the light that leaked around our Ghost-hide canopy. « So we see the same colors. The light of that star gets here a little faster. What difference does it make? »

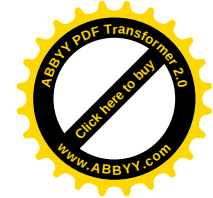
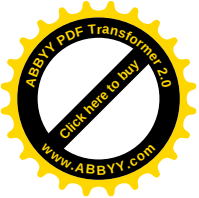
Pael shook his head. « Child, a fundamental constant like lightspeed is embedded in the deep structure of our universe. Lightspeed is part of the ratio known as the fine structure constant. » He started babbling about the charge on the electron, but Jeru cut him off.

She said, « Case, the fine structure constant is a measure of the strength of an electric or magnetic force. »

I could follow that much. « And if you increase lightspeed—«

« You reduce the strength of the force. » Pael raised himself.

« Consider this. Human bodies are held together by molecular binding energy—electromagnetic forces. Here, electrons are more loosely bound to atoms; the atoms in a molecule are more loosely bound to each other. » He rapped on the cast on my arm. « And so your bones are more brittle,



your skin more easy to pierce or chafe. Do you see? You too are embedded in spacetime, my young friend. You too are affected by the Ghosts' tinkering. And because lightspeed in this infernal pocket continues to increase—as far as I can tell from these poor experiments—you are becoming more fragile every second. »

It was a strange, eerie thought: that something so basic in my universe could be manipulated. I put my arms around my chest and shuddered.

« Other effects, » Pael went on bleakly. « The density of matter is dropping. Perhaps our structure will eventually begin to crumble. And dissociation temperatures are reduced. »

Jeru snapped, « What does that mean? »

« Melting and boiling points are reduced. No wonder we are overheating. It is intriguing that bio systems have proven rather more robust than electromechanical ones. But if we don't get out of here soon, our blood will start to boil. . . . »

« Enough, » Jeru said. « What of the star? »

« A star is a mass of gas with a tendency to collapse under its own gravity. But heat, supplied by fusion reactions in the core, creates gas and radiation pressures that push outward, counteracting gravity. »

« And if the fine structure constant changes—«

« Then the balance is lost. Commissary, as gravity begins to win its ancient battle, the fortress star has become more luminous—it is burning faster. That explains the observations we made from outside the cordon. But this cannot last. »

« The novae, » I said.

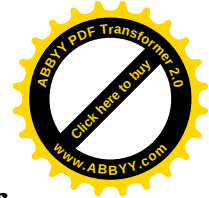
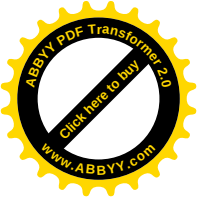
« Yes. The explosions, layers of the star blasted into space, are a symptom of destabilized stars seeking a new balance. The rate at which our star is approaching that catastrophic moment fits with the lightspeed drift I have observed. » He smiled and closed his eyes. « A single cause predicating so many effects. It is all rather pleasing, in an aesthetic way. »

Jeru said, « At least we know how the ship was destroyed. Every control system is mediated by finely tuned electromagnetic effects. Everything must have gone crazy at once. . . . »

We figured it out. The Brief Life Burns Brightly had been a classic GUTship, of a design that hasn't changed in its essentials for thousands of years. The lifedome, a tough translucent bubble, contained the crew of twenty. The 'dome was connected by a spine a klick long to a GUTdrive engine pod.

When we crossed the cordon boundary—when all the bridge lights failed—the control systems went down, and all the pod's superforce energy must have tried to escape at once. The spine of the ship had thrust itself up into the lifedome, like a nail rammed into a skull.

Pael said dreamily, « If lightspeed were a tad faster, throughout the universe, then hydrogen could not fuse to helium. There would only be hydrogen: no fusion to power stars, no chemistry. Conversely if lightspeed were a little lower, hydrogen would fuse too easily, and there would be no hydrogen, nothing to make stars—or water. You see how critical it all is? No doubt the Ghosts' science of fine-tuning is advancing considerably here on the Orion Line, even as it serves its trivial defensive purpose . . . »



Jeru glared at him, her contempt obvious. « We must take this piece of intelligence back to the Commission. If the Ghosts can survive and function in these fast-light bubbles of theirs, so can we. We may be at the pivot of history, gentlemen. »

I knew she was right. The primary duty of the Commission for Historical Truth is to gather and deploy intelligence about the enemy. And so my primary duty, and Pael's, was now to help Jeru get this piece of data back to her organization.

But Pael was mocking her.

« Not for ourselves, but for the species. Is that the line, Commissary? You are so grandiose. And yet you blunder around in comical ignorance. Even your quixotic quest aboard this cruiser was futile. There probably is no bridge on this ship. The Ghosts' entire morphology, their evolutionary design, is based on the notion of cooperation, of symbiosis; why should a Ghost ship have a metaphoric head? And as for the trophy you have returned—« He held up the belt of Ghost artifacts. « There are no weapons here. These are sensors, tools. There is nothing here capable of producing a significant energy discharge. This is less threatening than a bow and arrow. » He let go of the belt; it drifted away. « The Ghost wasn't trying to kill you. It was blocking you. Which is a classic Ghost tactic. »

Jeru's face was stony. « It was in our way. That is sufficient reason for destroying it. »

Pael shook his head. « Minds like yours will destroy us, Commissary. »

Jeru stared at him with suspicion. Then she said, « You have a way. Don't you, Academician? A way to get us out of here. »

He tried to face her down, but her will was stronger, and he averted his eyes.

Jeru said heavily, « Regardless of the fact that three lives are at stake—does duty mean nothing to you, Academician? You are an intelligent man. Can you not see that this is a war of human destiny? »

Pael laughed. « Destiny—or economics? »

I looked from one to the other, dismayed, baffled. I thought we should be doing less yapping and more fighting.

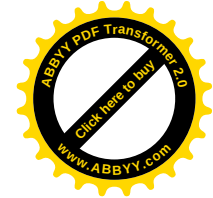
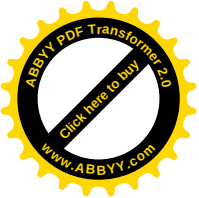
Pael said, watching me, « You see, child, as long as the explorers and the mining fleets and the colony ships are pushing outward, as long as the Third Expansion is growing, our economy works. The riches can continue to flow inward, into the mined-out systems, feeding a vast horde of humanity who have become more populous than the stars themselves. But as soon as that growth falters . . . »

Jeru was silent.

I understood some of this. The Third Expansion had reached all the way to the inner edge of our spiral arm of the galaxy. Now the first colony ships were attempting to make their way across the void to the next arm.

Our arm, the Orion Arm, is really just a shingle, a short arc. But the Sagittarius Arm is one of the galaxy's dominant features. For example, it contains a huge region of star-birth, one of the largest in the galaxy, immense clouds of gas and dust capable of producing millions of stars each. It was a prize indeed.

But that is where the Silver Ghosts live.



When it appeared that our inexorable expansion was threatening not just their own mysterious projects but their home system, the Ghosts began, for the first time, to resist us.

They had formed a blockade, called by human strategists the Orion Line: a thick sheet of fortress stars, right across the inner edge of the Orion Arm, places the Navy and the colony ships couldn't follow. It was a devastatingly effective ploy.

This was a war of colonization, of world-building. For a thousand years we had been spreading steadily from star to star, using the resources of one system to explore, terraform and populate the worlds of the next. With too deep a break in that chain of exploitation, the enterprise broke down.

And so the Ghosts had been able to hold up human expansion for fifty years.

Pael said, « We are already choking. There have already been wars, young Case: humans fighting human, as the inner systems starve. All the Ghosts have to do is wait for us to destroy ourselves, and free them to continue their own rather more worthy projects. »

Jeru floated down before him. « Academician, listen to me. Growing up at Deneb, I saw the great schooners in the sky, bringing the interstellar riches that kept my people alive. I was intelligent enough to see the logic of history—that we must maintain the Expansion, because there is no choice. And that is why I joined the armed forces, and later the Commission for Historical Truth. For I understood the dreadful truth which the Commission cradles. And that is why we must labor every day to maintain the unity and purpose of mankind. For if we falter we die; as simple as that. »

« Commissary, your creed of mankind's evolutionary destiny condemns our own kind to become a swarm of children, granted a few moments of loving and breeding and dying, before being cast into futile war. » Pael glanced at me.

« But, » Jeru said, « it is a creed that has bound us together for a thousand years. It is a creed that binds uncounted trillions of human beings across thousands of light years. It is a creed that binds a humanity so diverse it appears to be undergoing speciation. . . . Are you strong enough to defy such a creed now? Come, Academician. None of us chooses to be born in the middle of a war. We must all do our best for each other, for other human beings; what else is there? »

I touched Pael's shoulder; he flinched away. « Academician—is Jeru right? Is there a way we can live through this? »

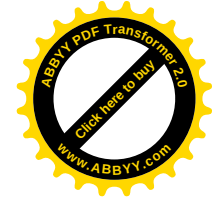
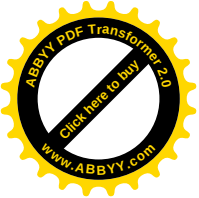
Pael shuddered. Jeru hovered over him.

« Yes, » Pael said at last. « Yes, there is a way. »

The idea turned out to be simple.

And the plan Jeru and I devised to implement it was even simpler. It was based on a single assumption: Ghosts aren't aggressive. It was ugly, I'll admit that, and I could see why it would distress a squeamish earthworm like Pael. But sometimes there are no good choices.

Jeru and I took a few minutes to rest up, check over our suits and our various injuries, and to make ourselves comfortable. Then, following patrol SOP once more, we made our way back to the pod of immature hides.



We came out of the tangle and drifted down to that translucent hull. We tried to keep away from concentrations of Ghosts, but we made no real effort to conceal ourselves. There was little point, after all; the Ghosts would know all about us, and what we intended, soon enough.

We hammered pitons into the pliable hull, and fixed rope to anchor ourselves. Then we took our knives and started to saw our way through the hull.

As soon as we started, the Ghosts began to gather around us, like vast antibodies.

They just hovered there, eerie faceless baubles drifting as if in vacuum breezes. But as I stared up at a dozen distorted reflections of my own skinny face, I felt an unreasonable loathing rise up in me. Maybe you could think of them as a family banding together to protect their young. I didn't care; a lifetime's carefully designed hatred isn't thrown off so easily. I went at my work with a will.

Jeru got through the pod hull first.

The air gushed out in a fast-condensing fountain. The baby hides fluttered, their distress obvious. And the Ghosts began to cluster around Jeru, like huge light globes.

Jeru glanced at me. « Keep working, tar. »

« Yes, sir. »

In another couple of minutes I was through. The air pressure was already dropping. It dwindled to nothing when we cut a big door-sized flap in that roof. Anchoring ourselves with the ropes, we rolled that lid back, opening the roof wide. A few last wisps of vapor came curling around our heads, ice fragments sparkling.

The hide babies convulsed. Immature, they could not survive the sudden vacuum, intended as their ultimate environment. But the way they died made it easy for us.

The silvery hides came flapping up out of the hole in the roof, one by one. We just grabbed each one—like grabbing hold of a billowing sheet—and we speared it with a knife, and threaded it on a length of rope. All we had to do was sit there and wait for them to come. There were hundreds of them, and we were kept busy.

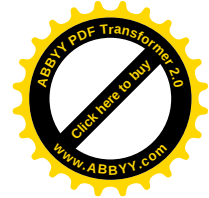
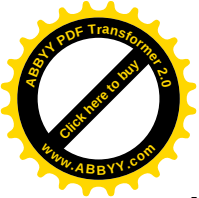
I hadn't expected the adult Ghosts to sit through that, non-aggressive or not; and I was proved right. Soon they were clustering all around me, vast silvery bellies looming. A Ghost is massive and solid, and it packs a lot of inertia; if one hits you in the back you know about it. Soon they were nudging me hard enough to knock me flat against the roof, over and over. Once I was wrenched so hard against my tethering rope it felt as if I had cracked another bone or two in my foot.

And, meanwhile, I was starting to feel a lot worse: dizzy, nauseous, overheated. It was getting harder to get back upright each time after being knocked down. I was growing weaker fast; I imagined the tiny molecules of my body falling apart in this Ghost-polluted space.

For the first time I began to believe we were going to fail.

But then, quite suddenly, the Ghosts backed off. When they were clear of me, I saw they were clustering around Jeru.

She was standing on the hull, her feet tangled up in rope, and she had knives in both hands. She was slashing crazily at the Ghosts, and at the baby hides that came flapping past her, making no attempt to capture



them now, simply cutting and destroying whatever she could reach. I could see that one arm was hanging awkwardly—maybe it was dislocated, or even broken—but she kept on slicing regardless.

And the Ghosts were clustering around her, huge silver spheres crushing her frail, battling human form.

She was sacrificing herself to save me—just as Captain Teid, in the last moments of the Brightly, had given herself to save Pael. And my duty was to complete the job.

I stabbed and threaded, over and over, as the flimsy hides came tumbling out of that hole, slowly dying.

At last no more hides came.

I looked up, blinking to get the salt sweat out of my eyes. A few hides were still tumbling around the interior of the pod, but they were inert and out of my reach. Others had evaded us and gotten stuck in the tangle of the ship's structure, too far and too scattered to make them worth pursuing further. What I had got would have to suffice.

I started to make my way out of there, back through the tangle, to the location of our wrecked yacht, where I hoped Pael would be waiting.

I looked back once. I couldn't help it. The Ghosts were still clustered over the ripped pod roof. Somewhere in there, whatever was left of Jeru was still fighting.

I had an impulse, almost overpowering, to go back to her. No human being should die alone. But I knew I had to get out of there, to complete the mission, to make her sacrifice worthwhile.

So I got.

Pael and I finished the job at the outer hull of the Ghost cruiser.

Stripping the hides turned out to be as easy as Jeru had described. Fitting together the Planck-zero sheets was simple too—you just line them up and seal them with a thumb. I got on with that, sewing the hides together into a sail, while Pael worked on a rigging of lengths of rope, all fixed to a deck panel from the wreck of the yacht. He was fast and efficient: Pael, after all, came from a world where everybody goes solar sailing on their vacations.

We worked steadily, for hours.

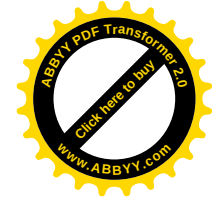
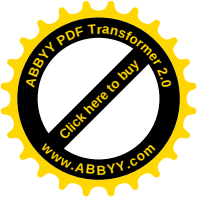
I ignored the varying aches and chafes, the increasing pain in my head and chest and stomach, the throbbing of a broken arm that hadn't healed, the agony of cracked bones in my foot. And we didn't talk about anything but the task in hand. Pael didn't ask what had become of Jeru, not once; it was as if he had anticipated the commissary's fate.

We were undisturbed by the Ghosts through all of this.

I tried not to think about whatever emotions churned within those silvered carapaces, what despairing debates might chatter on invisible wavelengths. I was, after all, trying to complete a mission. And I had been exhausted even before I got back to Pael. I just kept going, ignoring my fatigue, focusing on the task.

I was surprised to find it was done.

We had made a sail hundreds of meters across, stitched together from the invisibly thin immature Ghost hide. It was roughly circular, and it was connected by a dozen lengths of fine rope to struts on the panel we had wrenched out of the wreck. The sail lay across space, languid ripples crossing its glimmering surface.



Pael showed me how to work the thing. « Pull this rope, or this . . . » the great patchwork sail twitched in response to his commands. « I've set it so you shouldn't have to try anything fancy, like tacking. The boat will just sail out, hopefully, to the cordon perimeter. If you need to lose the sail, just cut the ropes. »

I was taking in all this automatically. It made sense for both of us to know how to operate our little yacht. But then I started to pick up the subtext of what he was saying.

Before I knew what he was doing he had shoved me onto the deck panel, and pushed it away from the Ghost ship. His strength was surprising.

I watched him recede. He clung wistfully to a bit of tangle. I couldn't summon the strength to figure out a way to cross the widening gap. But my suit could read his, as clear as day.

« Where I grew up, the sky was full of sails . . . »

« Why, Academician? »

« You will go further and faster without my mass to haul. And besides—our lives are short enough; we should preserve the young. Don't you think? »

I had no idea what he was talking about. Pael was much more valuable than I was; I was the one who should have been left behind. He had shamed himself.

Complex glyphs criss-crossed his suit. « Keep out of the direct sunlight. It is growing more intense, of course. That will help you. . . . »

And then he ducked out of sight, back into the tangle. The Ghost ship was receding now, closing over into its vast egg shape, the detail of the tangle becoming lost to my blurred vision.

The sail above me slowly billowed, filling up with the light of the intense sun. Pael had designed his improvised craft well; the rigging lines were all taut, and I could see no rips or creases in the silvery fabric.

I clung to my bit of decking and sought shade.

Twelve hours later, I reached an invisible radius where the tactical beacon in my pocket started to howl with a whine that filled my headset. My suit's auxiliary systems cut in and I found myself breathing fresh air.

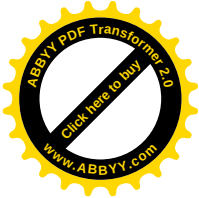
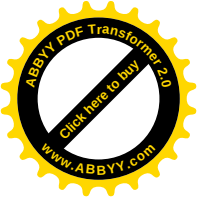
A little after that, a set of lights ducked out of the streaming lanes of the fleet, and plunged toward me, growing brighter. At last it resolved into a golden bullet shape adorned with a blue-green tetrahedron, the sigil of free humanity. It was a supply ship called The Dominance of Primates.

And a little after that, as a Ghost fleet fled their fortress, the star exploded.

As soon as I had completed my formal report to the ship's commissary—and I was able to check out of the Dominance's sick bay—I asked to see the captain.

I walked up to the bridge. My story had got around, and the various med patches I sported added to my heroic mythos. So I had to run the gauntlet of the crew—« You're supposed to be dead, I impounded your back pay and slept with your mother already »—and was greeted by what seems to be the universal gesture of recognition of one tar to another, the clenched fist pumping up and down around an imaginary penis.

But anything more respectful just wouldn't feel normal.



The captain turned out to be a grizzled veteran type with a vast laser burn scar on one cheek. She reminded me of First Officer Till.

I told her I wanted to return to active duty as soon as my health allowed.

She looked me up and down. « Are you sure, tar? You have a lot of options. Young as you are, you've made your contribution to the Expansion. You can go home. »

« Sir, and do what? »

She shrugged. « Farm. Mine. Raise babies. Whatever earthworms do. Or you can join the Commission for Historical Truth. »

« Me, a commissary? »

« You've been there, tar. You've been in amongst the Ghosts, and come out again—with a bit of intelligence more important than anything the Commission has come up with in fifty years. Are you sure you want to face action again? »

I thought it over.

I remembered how Jeru and Pael had argued. It had been an unwelcome perspective, for me. I was in a war that had nothing to do with me, trapped by what Jeru had called the logic of history. But then, I bet that's been true of most of humanity through our long and bloody history. All you can do is live your life, and grasp your moment in the light—and stand by your comrades.

A farmer—me? And I could never be smart enough for the Commission. No, I had no doubts.

« A brief life burns brightly, sir. »

Lethe, the captain looked like she had a lump in her throat. « Do I take that as a yes, tar? »

I stood straight, ignoring the twinges of my injuries. « Yes, sir! »