

ANALOG

The background of the cover is a detailed illustration of three astronauts in a futuristic space environment. The astronaut in the foreground is a woman with dark hair, wearing a blue and orange space suit with a fur-lined hood. She is looking off to the side. Behind her, another astronaut is visible, and to the right, a third astronaut is shown from the chest up, wearing a similar suit. The scene is lit with warm, orange and blue tones, suggesting a high-tech, possibly extraterrestrial setting.

SCIENCE FICTION AND FACT

The Coward's Option

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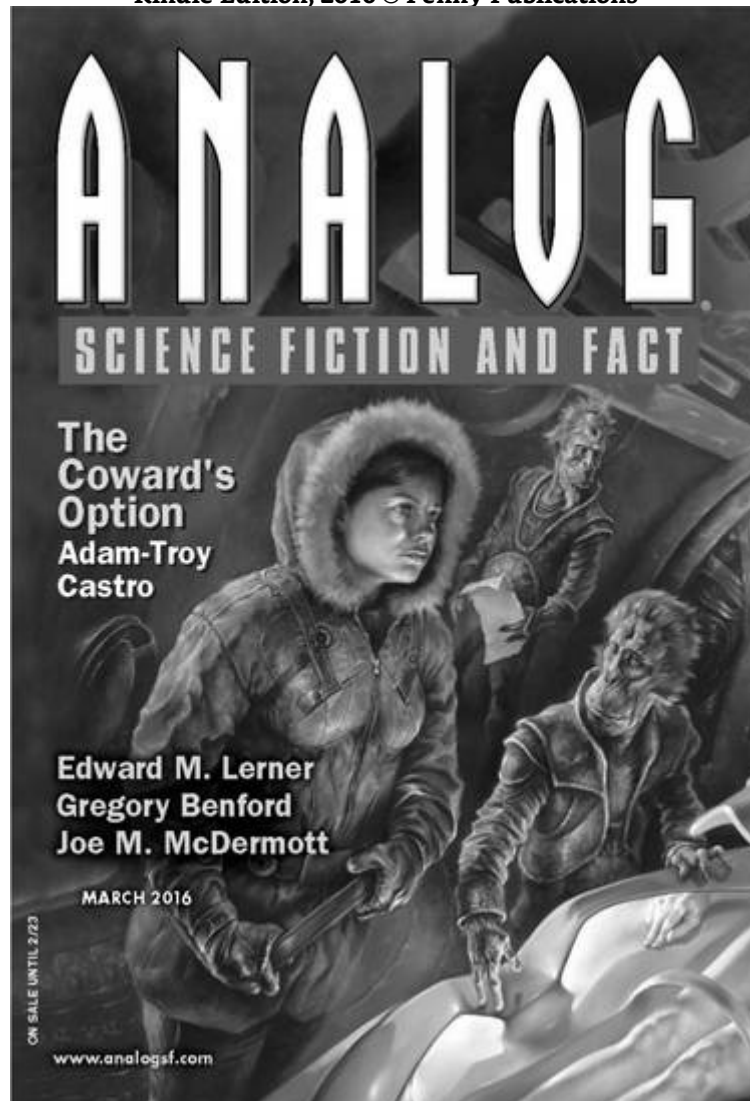
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The Coward's Option

Adam-Troy Castro | 20792 words

Griff Varrick was a ruddy and furtive man, whose wooly red hair sat centered atop his eggshaped head like a thatch of moss. He had, at some point since his recent conviction for murder, taken a swing at one of his guards, not incidentally a man who had, before the arrest, been a friend of his. As a result, he was considered dangerous to himself and to others; so for this conversation he'd been given a neural block that reduced him to a state of temporary quadriplegia, more confining than any known chains. The layer of fat he'd picked up during his months in confinement had nothing to do but sag.

He said, "I don't want to die."

Counselor Andrea Cort's expression, marked by thin eyebrows that tilted inward to meet with only the slightest gap of pure tension over the bridge of her nose, betrayed not an ounce of sympathy for his plight. The one lock of hair she kept long hung loose over one chiseled cheekbone, bisecting that side of her face like a slash. As uniform she wore her usual severe black suit, more formal than any her superiors in the Dip Corps actually required outside of courtrooms, with the addition of tight black gloves she'd adopted to ward off the chill that somehow found its way into even the warmest rooms of this embassy to a planet that was exceptionally miserable and frigid. In her ten days on Caithiriin, she had already overheard and ignored one muttered comment to the effect that these adjectives described her, as well. She would never have admitted it, but it had secretly pleased her.

She told him, "You shouldn't have killed somebody."

He grew louder, more insistent: "Do you have any idea how they execute people on this planet?"

Cort wondered how Varrick could imagine she'd been working on the case this long and not found out. "I don't see how it's relevant."

"Slow death by crushing, that's how. They strap you down and lay a flat board over you. Then they put a basin on top of that and let water dribble into it, a little bit at a time. It gets heavier with every drop. They say it takes hours before you even feel the weight, hours more before it starts to hurt, hours more after that before breathing becomes a problem, and hours more before bones start to break. They say I might live five days while in agony for three of them. Three *days*, Counselor."

Cort sighed. She was not a monster, despite a carefully cultivated image to the contrary, and she was absolutely vulnerable to the terror and desperation on the other side of the table. But she was also a realist. "I'm not saying I don't feel sorry for you. But the matter's been settled. You've run out of legal options."

"I refuse to die that way."

"Oh, well," she said mildly. "You *refuse*. Is that how it works? Very well, then. Now that you've specified you *refuse*, I should let the locals know that you feel that way, and we should be able to clear this misunderstanding right up."

His trapped eyes widened. "Is this a joke to you, Counselor?"

"No, Mr. Varrick. Your feelings are understood, but irrelevant. Unless you have information that casts doubt on the result, there's nothing I can do for you."

"And you take pleasure in that, don't you? You... *bitch*."

And that, the epithet that ended so many of Andrea Cort's professional

interactions, should have been the end of it.

She was ready to walk out and end the final conversation Varrick was scheduled to have with any human being before being turned over to Caithiriin hands.

She began to stand.
Then he said, "Wait—"

The only reason Varrick was still in human custody at all, this many months after his conviction, was the same one that, under most interspecies treaties, allowed human beings charged of serious crimes on alien-held worlds to remain under the care of their own species until all legal remedies were exhausted. Cort was the last of those legal remedies.

The custody issue was a minor mercy, reciprocal to most species that had diplomatic relations with the Confederacy. Locals weren't always expert in the care and feeding of human beings whose crimes were too serious to warrant protection under the principle of diplomatic immunity. In many cases they would have done any amount of damage to a human prisoner without meaning to, just by subjecting him to the same prison environment as one of their own kind.

In the case of the Caith, who preferred nearfreezing temperatures and had an atmosphere only about a tenth as dense as what humans prefer, Varrick would have perished of hypothermia or suffocation long before the verdict was read.

Nobody on either side disputed the man's guilt, not even Varrick himself. By the time of his arrival on Caithiriin, Varrick's career had already involved three prosecutions for petty thievery from his fellow indentures and a number of incidents of attempted robbery from the indigenes of the worlds where he'd been assigned. Thievery was in his blood, that's all; it was something he did not possess the will or the character to stop doing.

Caithiriin, a low-prestige assignment where a number of diplomatic careers had gone to die, should have been his last chance. But even there, driven by whatever motivates a man who cannot live unless he's taking what's not his, he'd started slipping out at night to loot a local holy site of its relics and had, with competence unusual for him, gotten away with this for weeks on end before local authorities discovered the thefts and posted extra security to stop him. On the idiot's very next trip, surprised by the presence of a Caith guard where there had been no guards before, and where an intellect of his limitations had just naturally assumed that there would be no guards ever, Varrick had simply killed the creature with a blow to the head from a sacred figurine that was now profaned forever from its momentary use as bludgeon, thus adding blasphemy to his array of more serious crimes.

Being a compulsive thief and an idiot, he hadn't figured that the new security precautions installed by the Caith would now include holo cameras to record every move on the grounds.

It was a petty, stupid, obvious crime, committed by a petty, stupid, obvious man, who never should have been inducted into the Corps in the first place.

The Corps had erected the usual legal barriers to trying him by local laws, going so far as to assure the locals that his betrayal of the service merited a life in prison already. But there really wasn't any defensible reason, short of the irrelevant humanitarian grounds, why they weren't obliged to let the locals

have him.

Cort's task, a mere formality at this point, had been to handle the final review—the last-ditch effort mandated by treaty to find some loophole that might free him. She hadn't expected, or found, any procedural or diplomatic grounds for appeal. There was simply no point, principled or perverse, in even trying to prevent the Caithiriins from executing him.

With that conclusion, she had looked forward to lying comatose in a bluegel crypt for the transport back to her home base, the cylinder world New London; but Varrick, utilizing the last right of defense that remained to him, had asked to see her one final time. And so, this pointless exercise. In truth, she'd expected little. Most people who've exhausted their legal options, not just in capital cases but in every kind of proceeding from the smallest suit on up, continue to believe that they can still affect the outcome if they just keep talking. This would be nothing more than the *No, wait, wait* phase, the last desperate bargaining of the trapped man who honestly believed that his own story, the most important narrative ever written in the history of the Universe, couldn't possibly end like this. Surely, the hind-brain reasoning goes, there had to be one more twist! A surprise ending! A pardon! A last-minute charge to the rescue!

The hind-brain has never been an expert in legal procedure.

In any event, now that she'd gotten to the inevitable *you bitch* moment, and the useless *wait* that came after it, Cort was now free to leave.

"I am sorry for you, Mr. Varrick, but if that's all there is—"

From the crafty expression that suddenly flashed on a face not built for expressions of great intelligence, Varrick still believed that he had one card left to play. "There's an alternative."

"That alternative," she said mildly, "was not to kill anybody."

"Don't get high-and-mighty with me, Counselor. You've killed."

Yes, she had. Once as a child, once in the line of duty, two more times her superiors in the Dip Corps didn't know about. Cort was well used to having her history thrown in her face, and was, if anything, darkly amused by having it done by people with no other cards to play. "I'm not the one whose fate is at issue here. I'm giving you thirty more seconds to interest me."

"It's going to take more than thirty seconds to explain—"

"I didn't say you only had thirty seconds to explain. I said you had only thirty seconds to interest me. Start and give me a reason to keep listening. You're now down to fifteen seconds."

And of course, now that the door he'd kicked open was once again in danger of closing, panic struck. He rushed through what explanation he could without pause, the words racing after one another like refugees. "Look it up. Whenever it's one of their own convicted of murder, they present the poor bugger with a choice. They can choose to be executed or they can choose to undergo this treatment they have, that supposedly fixes them so they don't kill again."

Cort felt an unwelcome prickle on the base of her spine: the sign of unwanted interest in a problem that might keep her here, on this monochrome world of frost and darkness, where even the sealed habitats kept warm enough to satisfy human beings still felt cold by sheer association with the landscape outside. She was well aware how illogical this was; after all, the temperature outside New London was the absolute vacuum of orbital space and much colder than anything Caithiriin had to offer. But New London still possessed the

warmth of a place she was used to, and Caithiriin was an unlovely place with nothing to recommend it but a task she had found simplistic and unrewarding. "That sounds like an urban legend, bondsman. Nobody's ever mentioned it to me."

"It exists. It's not used often, but it exists. Like I said, check it out. I'm not making up anything."

"I'll check it out," she assured him. "But if this option exists, why didn't you mention it before?"

"I was, whaddayacallit, keeping it in reserve. Hoping the case wouldn't go as far as it has. Hoping you'd find some procedural reason to ask for a retrial. But now that I've got nothing left to lose..." He paused, unable to shrug, but communicating the same nothing-to-lose sentiment with a flutter of his eyebrows. "The bastards never even offered it to me. At least, you owe it to me to ask the goddamned question, why."

Cort refrained from telling Varrick that she owed him nothing. "I'll let you know what I find out."

But it wasn't the thought of saving his life that drove her.

It was another simple question, which she found far more disturbing.

Cort had never been impressed with any of the Confederate ambassadors she'd met in the course of her travels. In most cases they had struck her as bureaucratic placeholders, mediocrities granted titles and positions that conferred the patina of expertise without ever quite requiring it. She had in her time known one ambassador whose idiocy had almost started a war, and another whose total lack of interest in his job had left him spending much of his day inebriated in his quarters, while his run-amok staff proceeded to turn his tenure into a series of diplomatic incidents.

She was so far not extremely impressed with Ambassador Virila Pendrake either, but then hadn't expected to be. The Caith were not a major race who merited the best the Dip Corps could offer, but rather an unprepossessing little civilization that possessed only three borderline habitable worlds, all in one solar system, and a total population of no more than about thirty million; not even enough to fill a minor human city. They barely existed, diplomatically; they only possessed a place in trading circles because of some of their substantial innovations in information-processing technology. Posting here was therefore for beginners like the fresh-faced indentures who constituted most of the staff, outright embarrassments like the larcenous Varrick, or those who had risen only so far in their careers and would never ascend any higher—a group in which she included Pendrake.

Meeting and dealing with Pendrake had not given her any reason to alter her preconceptions. The woman was a tight-lipped, orange-complexioned prig whose nose and chin came to points and whose professional demeanor seemed to testify nothing more than the aggrieved impatience of a woman whose life had known little but disappointment and was now an exercise in counting down the years still remaining on her Dip Corps bond. It was a completely different form of unpleasantness than the severity Cort found useful to cultivate in herself, which she liked to consider a tool of her profession. But then, Cort was a prosecutor and had use for a fearsome reputation. Pendrake was an ambassador, which meant that at least part of her job was to be ingratiating... and Cort had yet to see her manage that trick. The woman had brought up Cort's

own controversial legal status three times in the course of their very first briefing—and not to clarify the information, but as an attempt at preemptive intimidation, which appeared to be the only management tactic she even understood.

She was about to find out that Cort was better at it.

The embassy lounge was a lonely place that consisted of a few round tables for gatherings, a dartboard, a chess set, and an immersion tank filled with topical euphorics that didn't look like they'd been filtered of pollutants any time recently.

Pendrake was at the least of the offered entertainments, a holographic boxing simulator calibrated to a setting so low that trading punches with it was less like sparring with an opponent than beating the crap out of a weakling who didn't even know enough to protect his face. Given Pendrake's powerful arms and rock-hard shoulders, more appropriate for a soldier than the likes of an ambassador, maybe that was the very point. The simulated figure moaning with every bare-knuckled blow had been programmed with the face of a certain Dip Corps commander, known for the malicious delight he took in banishing mediocrities to low-prestige positions: a commander who just happened to be her direct superior.

Pendrake didn't meet Cort's eyes when she walked in, but instead threw a groin-punch that made the projected image squeal in breathless agony. "You done with him?"

"For now."

Another punch. "I was hoping you'd wrap it up today."

"Your man in there holds that he wasn't given a sufficiently zealous defense."

"Sure he does," Pendrake grumbled, directing fresh assaults at her target's face and chest. "A guy like that thinks the defense should always be faulted, by not being eloquent enough during the summation. *Your honor, look at this poor baby. Sure, he killed his Mommy and Daddy, but we need to take pity on the orphan!*"

Cort ignored the ancient gag. "I don't believe the summation to have been the problem."

Pendrake turned away from the cowering, bloody, image without bothering to pause the program—which, nevertheless, did not take advantage of her lack of attention to score any strikes on her unprotected form. "Oh?"

"Varrick maintains that the local legal system offers an alternative punishment that you've failed to explore. My initial inquiries confirm that this is indeed the case. My question to you is whether you mounted your defense without first bothering to learn all his options... or whether you had some other reason for keeping him, and me, ignorant about them."

Pendrake stepped away from the simulated enemy, which sputtered out and contracted to a lone dot before blinking off. "What are you implying?"

"I never imply, Ambassador. I just come out and say. When I ask you how this failure occurred, it's only to determine what form your dereliction of duty took."

Pendrake wiped her lips with the back of her hand. "It wasn't dereliction of anything. The Corps holds itself to a higher standard. Indentures who commit serious crimes on alien soil put all of us at risk, and aren't entitled to any easy out the locals let slip into their law books."

Cort remained cool. "So it was deliberate, then."

"It was a choice, Counselor. We can't just tolerate this kind of black eye on our position here."

"True. However, as it happens, the Dip Corps has its own internal legal body—of which I'm a part—and if he merits further prosecution by that body, which is likely if exercising his rights according to local law can spare him a bloody execution here, then our dissatisfaction with his behavior can be addressed via established law and not by some embarrassed ambassador just throwing her hands up and letting the locals have him without contest. That, Ambassador, is an act of gross negligence that threatens what little advancement you've managed during your career."

Pendrake just seethed. "Go to hell."

Cort flashed her least pleasant smile. "Not unlikely. Will that be your defense?"

The ambassador advanced until she and Cort were nose to nose, or as close to that position as they could get, given her superior height and mass. "You don't want to continue this conversation right now. Look at the difference between me and you. I can break you in half."

Cort considered taking this further and saw no particular profit in it, not right away in any event. So she held out both palms, in a gesture she hoped the ambassador would find placating. "I'll let myself out."

The next morning Cort woke early, exercised, then sat on the edge of her bed and ate the tasteless compressed rations she always carried in her gear rather than subject herself to the discomfort she had long felt eating meals alongside other human beings. Afterward, she took an extended hot shower, as she spent most of her time on orbital environments and usually had to rely on timed sonic pulses rather than experience the feel of real water on her skin. When she was done, she applied a blood-oxygenation patch to her upper arm before dressing in one of her trademark severe black suits, gathering her cold-weather gear, and proceeding down to the embassy's skimmer bay.

There she found one of the younger indentures, a dusky young woman she'd spotted in the embassy hallways but never spoken to before today, waiting for her in bulky cold-weather gear complete with furry hood and mittens.

"Counselor. I'm Marys Kearn. I've been assigned to accompany you today."

Cort tossed her satchel into the skimmer. "I didn't request a babysitter."

Kearn swallowed, clearly dreading what her duty now obliged her to say.

"I'm sorry, Counselor, but local regulations say you need me."

"Oh?"

"The ambassador wanted me to tell you that under the circumstances she would have considered it her pleasure to accompany you herself, but feels your adversarial position has rendered this impossible."

Cort wouldn't have made it impossible for the ambassador, just unpleasant. But there was no reason she had to make this equally unpleasant for someone who had not yet transgressed in any way. "Very well. You can relax around me. I don't punish Embassy personnel for the spiteful gestures of their superiors."

Kearn remained just as stiff as before. "Understood."

"If that's actually you relaxing, we're going to get along just fine."

"Yes, Counselor."

The two of them boarded the skimmer, taking opposite positions in the passenger bay after the pilot, a blandly handsome young man Cort found of no particular interest, took his own position at the nav console. Their flight above the windblasted, functional, architecturally bland Caithic city would represent a distance so miniscule that on any more temperate world more congenial to human life, Cort would have likely just gotten up a little earlier and covered the route in a brisk walk. But on this frozen, effectively airless hell, embassy personnel didn't go for extended constitutions unless they were survival junkies or masochists... and today, with the squat gray buildings that were the Caith's unimaginative idea of architecture being slammed by one of those intervals of hail, sleet, and driving wind that typified this world's demented idea of weather, Cort was not sufficiently confident that travel on foot would leave her in shape for a potentially unpleasant negotiation.

As the open skimmer escaped through a sliding panel in the embassy roof, its invisible and intangible ionic shields maintained a toasty and oxygen-rich environment for passengers expecting a far chillier and more suffocating atmosphere at their destination.

The relative warmth of the cabin led Marys Kearn to lower her furry hood. She was slight of build, but taller than Cort by a head. Her round face featured full lips, a squat nose, a high forehead, and brown eyes that glittered with specks of gold. She wore her wooly brown hair tied behind her neck in a thick braid, dangling to her shoulder-blades.

Her clear discomfort with Cort prompted one of the counselor's rare compassionate thaws. "What's your field, bondsman?"

Kearn replied with the stiffness of a new diplomatic indenture well-accustomed to being interrogated. "Exosociology. Still in training. Yet to receive a career grade."

"Is this your first posting?"

"Yes, Counselor. I only arrived only three months ago."

Great Juje, she's a baby. "Then I congratulate you in joining the great farce known as interspecies diplomacy."

"Thank you, Counselor. It's been... interesting so far."

"In what way?"

"Well, my homeworld had a much less... uni form climate. We had places like this, but I nev er saw any of them. I lived in the tropics. Where it was green."

Cort grinned. "So naturally they thought you well-equipped for immediate assignment to a frozen wasteland."

Kearn needed a few seconds to decide how she was expected to respond to that one. "The... perversity of it did occur to me, Counselor."

"As your career continues, I think you'll find that your postings will continue to be that perverse, indeed malicious, unless you excel enough to be able to enforce your own preferences. Otherwise, you'll have twenty years or more of hating wherever you are, and you'll likely end up being as nasty a person as myself. But with that specialty, I presume you've already had extensive contact with the locals?"

"Yes, Counselor."

"Good. I have not. My interactions with the Caith have been minimal, and I therefore have little expertise in what they're like: what they consider required protocol, what they consider simple etiquette, and so on. I'm aware that your ambassador probably believes that she's punishing me by forcing me to have

you trail about wherever I go. But if you can just feel free to share your superior knowledge on this one issue, you can justify your presence and earn a positive evaluation from me that may well shorten how long you'll spend in purgatory before having input into your assignments. Is that clear?"

Kearn's lips dared the ghost of a grin. "Yes, Counselor."

"Don't limit yourself to answering direct questions, either. Volunteer information when you believe it to be useful."

The grin broadened and, for the first time, displayed a dazzlingly white set of teeth, lighting up her face and transforming her from serious young thing to beautiful woman. Then she seemed to remember herself and pulled back, to a more neutral expression. "Understood. In that case, I might actually have something for you now."

"Don't make me wait."

"These people," she said, "The Caith? They're polite enough, but don't make the mistake of thinking that they're welcoming."

"Elaborate."

"Well..."

"Piece of unsolicited advice," said Cort. "*Wel* is a hesitation word. It apologizes for your temerity in daring to share your thoughts. It implies that you're holding back, even suggests that you might be lying. Strike it from your professional vocabulary, as I have, and people will be more inclined to value your input."

Kearn stumbled over her next thought, no doubt because she had almost said *well* again, but recovered. "They're hard and cruel people. So direct, so unforgiving, that they're almost sadistic. Not just in their execution methods, but in all their dealings. They don't like off-worlders, any off-worlders, and they particularly don't like human beings; something that a number of them won't hesitate to share with you. They only accept off-world commerce at all because their environment has always been so marginal that their history has been a series of catastrophic famines. Their civilization has fallen multiple times, and they've come within shouting distance of extinction on a few of them, most recently within a hundred years of their first contact."

"I thought they had more than one world."

"They have three. You're on the most pleasant one."

Cort winced. "Continue."

"Confederate food imports have already gotten them through a few bad years... but they consider needing our help a stain on their honor, or something. They *want* to execute one of us, just to get some of their dignity back. It means something to them."

Cort chewed on her thumbnail. It was a nervous tic that she fell back on whenever she was particularly deep in thought. "Will that stop them from offering this alternative punishment Varrick talked about?"

"I've heard a very little bit about it, myself. I never really believed it was real. Even if real, it's been my impression that they don't like it any more than being executed, and only request the option if they have life responsibilities they can't bear to abandon. Career. Family. That kind of thing."

Cort's teeth snapped together as the thumbnail parted. She was about to ask something else, but by then the skimmer was descending through the open roof of the Caithiriin government building, and it was time to see how well those oxygenation patches worked.

The sad answer was *not very well*. There were some marginal worlds with human residents who grew accustomed to wearing oxygen-concentrating patches from birth, but for Cort, who had spent the entirety of her life on congenial planets and in an orbital environment set to optimal human conditions, it was a medical solution that failed to address actual psychological need. Her brain, reacting to data provided by her lungs, kept her fully aware that what she took in by inhaling was not enough to keep her conscious. She was at the same time prevented from actually losing consciousness by the patch that absorbed what atmospheric oxygen there was and concentrated it enough to keep her bloodstream supplied with everything it needed. The conflicting sensations—the certainty of imminent suffocation combined with the alertness of oxygen surfeit—kept her fluttering about the outer regions of panic, and fighting the natural impulse to hyperventilate, a solution that paradoxically might have caused her to pass out from breathing too much.

Only the presence of Marys Kearn, showing no apparent difficulty with the same instinctive contradiction, staved off panic. Cort would not show weakness before her, even if every cell in her body insisted that she was drowning. So she endured, and thought, *I hate planets*. An old complaint.

The Caithiriin government building was suffocating in more ways than that. It tended to low ceilings and looming narrow spaces, all lit in a manner that accentuated shadows, and all no better heated than the average tundra. Before leaving the controlled environment of the skimmer, Cort had bundled up in cold-weather gear that included her own bulky coat, furry hat, and thick gloves, but deeply regretted not also bringing a face mask, because her cheeks took no time at all to go numb, and even as she followed their Caith escort through labyrinthine hallways that seemed to be more about making the journey a lengthy one than providing an efficient route to the chambers they sought, she had to frequently rub her face to restore feeling.

It was a few minutes before the Caith escort arrived at a point not obviously different than any other, slid open a panel that was not visible until the moment he moved it, and instructed them to wait for the *Xe*.

Cort's hytex link did not translate the phrase for her, but then, she'd been warned it wouldn't. It was simplest to just think of the official they waited for as a judge and the specific word *Xe* as an honorific, giving him credit for long years of experience and wisdom. It was also useful to think of it as a term of dread and fear, as the Caith world had no use for juries and a *Xe* was not just the sole arbiter of guilt or innocence, but also the being personally responsible for carrying out executions. From her hurried reading of the prior night, a *Xe* had to study half his life to merit his lofty position, and then had to give up all family, all friendships, all sex, even his birth name, plus all of what the Caith considered luxury, to dwell in ascetic squalor in a small cell in what amounted to a basement, enjoying no recreation except for what relief he enjoyed whenever he got to ruin some unlucky bastard's day.

Cort was not unaware that this meant that *Xe* must have been psychologically inclined to savage misanthropy, as they gave up everything they had in exchange for whatever they got from being figures of fear.

Mercy would not be in a *Xe*'s vocabulary.

Good. That would make him easier for her to understand.

The room where they settled in waiting for him was therefore the exact

opposite of a human judge's chambers as could possibly be imagined. There was no dark gravity, no atmosphere of ceremonial dignity: just featureless gray walls and a pair of stone blocks, low enough that some human beings might have mistaken them as places to sit. Cort's reading had warned that using them as seats would be seen as an act of gross disrespect and another capital crime.

Upon entering a few minutes later, the *Xe* did not sit. He paced. He was, like the rest of his kind, a vaguely ape-like humanoid, with stubby arms and legs and a coarse layer of yellow fur that must have made him far more comfortable in this environment than any human could possibly be. His facial features included a secondary orifice of unknown purpose above the pebble-like, barely perceptible black eyes. His clothing had been designed to cover areas other than his prominent genitals, which included a flowery object that was likely his penis. That Cort could deal with; not every species had to be modest over the same body parts. What bothered her more was the ambiguity of his expression, the way it was impossible to tell whether the scowl he seemed to affect reflected his actual mood or just the natural geography of his face; probably both.

He did not permit any of the formalities Cort had prepared for. "Yes. Yes. All respect, all greetings. Forget that disgusting offal. It is unpleasant enough for me to be in the same room with sentients who smell the way you do. What excuse do you offer for delaying the execution now?"

"No excuse," Cort said. "Forgive us. We are visitors to your world, and there are many aspects of your system on which we remain ignorant."

"Human ignorance is not the problem. Human criminality is the problem."

"Forgive me," said Cort, "but I must take exception to that. We're not dealing with the level of criminality in human beings as a class, but about the specific criminality of one individual who also happens to be a human being. The rest of us, including myself, are just doing what we can, trying to treat you and your laws with respect, and are entitled to receive the same degree of respect in return."

The *Xe* froze in mid-step, cocking his head as if noticing Cort for the first time. For several heartbeats, it was unclear whether he would laugh, attack, or banish them from his sight. Then he made a guttural noise and muttered, "I will cede that distinction, while noting that the despicable criminal in question is not yet dead."

"If you will permit us the answer to this question, it remains our intention to resolve this unpleasant matter with all possible speed."

"Had your people been interested in resolving this matter with all possible speed, the disgusting Varrick would have been dead already." He grunted, paced from one end of his stone room to another, scratched himself, then advanced past the stone blocks to Cort, who he subjected to a few strong sniffs before retreating. "I haven't met with you before today. Is your embassy so dissatisfied with my verdict that they must bring in a new human to waste my time?"

"You have a point. I should have introduced myself. I'm Counselor Andrea Cort, a prosecutor for the Confederate Diplomatic Corps. My task here is not to delay justice, but to confirm that the case of the human murderer Varrick was resolved with full access to the provisions of Caithiriic law."

A snort. "The case was already resolved with full access to the provisions of Caithiriic law. I declared him guilty and ordered his execution. How many more delays must I tolerate before his filthy life is surrendered according to that decree?"

"Again: just the resolution of this one issue, *Xe*."

The *Xe* rolled his eyes, in his most anthropomorphic expression yet. Like many alien expressions, any congruence it may have had with similar human expressions was coincidental at best, and yet Cort formed the unmistakable certainty that in this particular case, the exasperation it communicated was not just accurate but exact. "Then ask."

"I have been informed that your race possesses an alternative to execution: a medical treatment that preserves the criminal's life while preventing any further offenses. This was not offered to Mr. Varrick at his sentencing. My question is whether this option is still available to him... and if not, why not?"

The *Xe* grew agitated, like the ape he resembled confronted with an invasion of his territory. He began to pace in circles, a dervish driven by nervous energy. "Does the criminal Varrick have a family he wishes to support? Responsibilities he cannot bear to abandon? Legal or professional obligations that would be violated by his death?"

"As far as I know, *Xe*, he just wishes to live."

"Then he's a contemptible coward, with as little respect for himself as he has for others."

"I agree," said Cort. "I do, however, believe it his right to be a coward."

"That would indeed go along with his right to be a thief and murderer." The *Xe* stopped in mid-step, cocking his head as if disturbed by a sound only he could hear. "This is interesting. I do not know whether the process will work on a human being. To my knowledge, it has never been attempted with one of your species. In truth, it would have to be the decision of those educated in the procedure."

"If they testify that the treatment will work on a human being, will you permit it?"

"A coward should be free to request the joyless life of a coward." He snorted a couple of times, then added, "Understand that my patience is at an end. This last delay lasts only as long as it will take you to receive your definitive answer. Once you receive it, Varrick will have two more days for consideration, and no further delays. After that, he will either take the coward's option or he will die." Cort nodded. "I have no problem with that."

"You did it," Kearn said.

They had returned to the skimmer but had not yet taken off, because Cort had not yet given the pilot their destination. Until then, she greeted the relative warmth and more easily breathable atmosphere of the skimmer like a drowning woman who had just, after long and heroic effort, broken surface to swallow her first breath. She spoke with reluctance. "This settles nothing."

"But if it does turn out that the treatment works on human beings..."

"First," Cort said, rubbing fingers that had not been kept sufficiently warm by the presence of thick gloves, "we still don't know that. Second, even if it does, Varrick doesn't get to decide whether he's free to choose the option. I do."

"It's his life."

"True, it is... as little value as he placed on that life, committing his crimes on a world where they would render him subject to execution. But my primary interest is not him. He is only a by-product. My primary interest lies in determining, first, whether this much-vaunted treatment works as advertised... and second, whether we can afford the ramifications of establishing such a

precedent.”

Kearn’s eyebrows knit. “But wouldn’t saving his life...”

The impatience Cort often felt for slower or less perceptive minds manifested as harshness, which infected her tone now. “I have no love for capital punishment, bondsman. I’m not against it on principle, but I’m not fond of it either. You may know that I’ve escaped it a couple of times myself. But there are considerations that outweigh the value of even the noblest human life—a distinction that I don’t need to point out is as far from Griff Varrick as it’s possible to get. The problem we’re faced with now is that by bringing this treatment of theirs to the forefront, that moronic little felon has exposed us to variables that affect not just his own ability to keep drawing breath, but also—if the Caiths are willing to share this technology—the course of justice on uncounted human worlds. Do you understand, yet? I’m not certain I’m confident in the ramifications of opening every prison door in human space. I need to know what we’re talking about.”

Kearn was silent for a long time. Then she said: “You’re right. This can be huge.”

“Oh, it’s huge either way. We just don’t know whether it also needs to be contained. Excuse me.” Cort went up front, to talk to the pilot.

Their next destination was the medical facility the *Xe* had named, not precisely a hospital in the same way that he was not precisely a judge: a small structure a short distance outside the city where they were to meet a redeemer, one of the learned individuals tasked with the medical rehabilitation of murderers. The *Xe* had explained that the treatment was sufficiently rare for the facility to open only fitfully, when its services were needed; but had also promised that under his order a redeemer would make it his business to rendezvous with them there, for their consultation. It would take longer for the redeemer to get there than it would for them to reach the same location, so Cort told the pilot to take his time.

As they performed a long slow circle over the city, which from the sky looked like a squalid wreck half-shrouded by the fresh snow piling up at street level, Cort returned to her previous seat and Kearn said, “If you don’t mind me asking...”

Cort rolled her eyes. “Oh. Here we go.”

“You know what I’m going to say?”

“In my personal experience,” Cort said, with the weariness that all such discussions left her, “all halting questions that begin with *if you don’t mind me asking* have to do with my legal status. You’re not the first to bring it up. Your ambassador did, with intense rudeness, the very first time I met her. Varrick did, almost as unpleasantly, only yesterday. It’s a common thing to bother me about. The only thing that ever changes is the intended level of politeness. You’re polite enough, I find, so if we must have this conversation, let’s get on with it.”

“If you’re a convicted murderer yourself...”

“I’m a known killer,” Cort snapped. “Not a convicted murderer. There’s a significant legal distinction between the two descriptions. I see no point in going into my own extenuating circumstances. But they exist. Proceed.”

“But if it has left you less than fully free...”

“We’re both indentured to the Corps. The only difference is, your contract leaves you indentured for, at most, what, twenty years? And mine leaves me

indentured for as long as they can still squeeze some use out of me—potentially, until I drop. Professionally, it's useful, because it places me under an umbrella of diplomatic immunity, and prevents me from being extradited to a couple of worlds that would like to put me in the same noose worn by your Varrick. But right now, neither one of us is fully free. Right now, we're equally owned. What's your point?"

Kearn remained silent for a long time, clearly aware that she'd given more offense than Cort admitted to, but unable to drop the question still burning in her. After a long time she shuddered and let it out: "I'm sorry if this was painful for you, Counselor. It just occurred to me that if the Corps does recognize the treatment as an alternative to criminal punishment... you might be able to apply the precedent to your own case and force them to free you."

Andrea Cort might have been startled by the sting of a venomous insect. She jerked, her eyes widening, her mouth falling open, her mingled terror and understanding cutting through her composed mask to reveal the true face of the damaged soul underneath. This lasted all of a second, and then the moment of vulnerability passed, and her harsh mask returned, as cold, and now as airless, as the stormy landscape visible beyond the skimmer's shields. "You're... more formidable than I gave you credit for, bondsman. I honestly hadn't thought of that. At all. Thank you."

"And I'm also thinking, if..."

Cort shuddered. "Forgive me. I think I'd prefer it if we didn't speak again for a while."

She turned away, losing herself in the storm, and did not speak again until after the skimmer pilot announced that they were landing.

The *Xe* had been manic, half-crazed, a constant study in motion that resembled the behavior of an imprisoned animal. Andrea Cort, who had not had any extended conversations with any Caith until that morning, could not help wondering how much of his demeanor she could attribute to eccentricity enforced by the isolated life he was obliged to live, and how much was true to the psychological baseline of his species.

The redeemer provided the much-needed contrast. He possessed a controlled, almost beatific stillness that rendered him otherworldly in ways that went beyond his furry Caithic physiognomy, and was in his own alien way, almost pleasant. He had introduced himself with a name that to Cort sounded like a four-note melody, interrupted after the third lingering tone by a hard consonant that sounded less like a glottal stop than a harsh clap—like the sound of a palm angrily striking a tabletop; it was no sound Cort felt assured of her own ability to make, though Marys Kearn did manage a close approximation of the melody in thanking the creature for his time.

He replied, "Those in my order have nothing but time. We are not often called upon to give cowards their choice of punishment. I believe that I was last summoned to this place a little more than a year ago, and the previous occasion was four years before that."

Kearn said, "We still thank you for agreeing to meet us."

"It is no hardship," the redeemer said, with what the hytex translator interpreted as significant warmth. "I've never actually met an offworlder, of any species, before. I knew you existed, and were disgusting, but have never until this moment met any of you. This is a fascinating experience."

Cort couldn't resist the observation, "I've heard we smell bad."

"Who told you that? Your stench could clear rooms, but I would never characterize it as *bad*. To me you smell more like... a powerful spice we use in some of our cooking. Please don't take it as a threat to eat you when I report that being this close to you makes me impatient for my next meal."

"That," Kearn said, "is the single oddest compliment of my life. Thank you."

The three of them gathered in a recovery chamber adjacent to the facility where cowards received their treatment. It had been a while since Cort had received medical treatment anywhere other than an automated AI source facility, but the room's general contours remained familiar, complete with the raised stone platform that was the Caithiriiiin version of a bed (which, Kearn explained, the species rarely used except in cases of illness or disability, as they tended to sleep standing up, for only thirty or forty seconds at a time). Despite the primitiveness of the arrangements provided for patient comfort, the rest of the accoutrements were advanced. There was an overhead vital signs monitor now reading a robust zero, and shelves stocked with liquids of various colors and presumed uses.

Cort had added a second oxygen patch to her arm in the hopes that this would ameliorate the difficulty she had even with the first patch, inhaling the thin local soup, but all that had done was add to her discomfort a not-unpleasant buzz a little like the onset of inebriation. As a result, Kearn had found herself obliged to pick up the conversational slack.

"What do you do with the rest of your time," Kearn wondered, "if you're never here?"

The redeemer said, "My professional duties consist of maintaining readiness and hoping that

I'm never called upon. I live nearby. I have a family. I breed *graiyan* for sport. I am honored for my commitment to justice. I have no complaints about my life."

Kearn said, "You are blessed, then."

"I like to think so."

Still reeling under her excessive oxygen-buzz, Cort managed to pull herself together long enough to ask the redeemer what the treatment entailed.

He showed fangs. "There is a saying among our kind: cowards have no secrets. Do you know what this means, Counselor Andrea Cort?"

"I do have my suspicions."

"In the case of this treatment," he said, "it is literal truth. The coward who takes this path has no secrets at all. His entire mind is opened, examined, read like a book. Everything, down to his slightest secret, is catalogued and transcribed. Would you allow this indignity for yourself?"

Cort did not offer a direct answer. "How can that prevent someone from committing more crimes?"

"The transcription is stored in a tiny device, which we implant at the base of the cowardly murderer's neck. We often add a mark that renders it visible to the naked eye, to maximize the disgrace, but this is not always done and I suppose it will be optional in the case of your murderer.

"Either way," he continued, "it takes full control over all his actions. It becomes in effect a second mind, a dominant mind, identical to the first except in that it has been programmed with certain behavioral modifications. His soul is not affected. Underneath, he gets to keep his inclinations, his instincts, his

memories, his impulses, everything that makes him the objectionable creature he is; but from that moment on it is the transcription, echoing his actual moment-to-moment circumstances, that makes all of his decisions for him. As both versions of his mind are for the most part identical, and both respond to identical stimuli according to the contours of his recorded personality, the difference between what he wants to do and what the transcription permits him to do, will most often be minimal. If he wishes to walk across a room, the transcription—reacting with an identical personality to the identical set of options—will also want to walk across the room, and so he will walk across the room. If he is hungry and wishes to eat a meal, the transcription will also want to eat a meal, and so he will eat the meal. If he has a thought he wishes to express in speech, the transcription will also wish to express that same thought in speech. The only time there will be a noticeable divergence between his thoughts and his actions is when his impulses guide him toward proscribed actions, or when an accepted authority orders him to take actions counter to his preference... at which point the transcription will not permit that behavior and will steer him toward more responsible courses of action, until his impulses and his options are once again congruent.”

Kearn said, “Won’t he be aware he’s being controlled?”

“It will be most obvious to him on those occasions when his actions differ from his impulses. Say, when he wishes to break an innocent’s skull with a sacred figurine, and the transcription says that he should put the figurine down and surrender. The rest of the time, Counselor Andrea Cort: can you even testify, right now, that your actions are your own? That you are not being controlled by artificial means and forced into behaviors that you only believe to be the products of your own free will? Can you say this of Marys Kearn or any other human being you know?”

Many years later, Andrea Cort would have reason to look back on this conversation and reflect on ironies still hidden to her today. But right now she had no immediate answer. She bit her thumbnail. “Your society still looks down on any convicted killer who chooses this treatment over an extended and painful execution... to the point where most go ahead with the execution anyway. Why?”

The Caith species did not seem to possess a gesture equivalent to the human shrug, but the slight tilt of the redeemer’s head communicated the noncommittal hesitation of a creature who now had leave to speculate on matters he previously might have considered too elementary to contemplate. “Perhaps it is because we all still know what they are like inside. Perhaps we despise interacting with those who behave themselves and obey the rules and in all other ways act according to the laws they once broke, who may treat us with absolute courtesy but who, by the weight of the evidence available to us, might be even at the same moment straining with all their co-opted will to curse our names and wrap their hands around the others. Perhaps it is impossible to look at such a person and not know that, however sane and blameless their current actions might be, they might just as well be raging maniacs, with minds driven but nothing but their old bloodlust. Perhaps murderers resist the option because they are aware that they will no longer be able to defend themselves, regardless of the provocation; or for that matter resort to suicide, the option we all abhor but secretly treasure as an escape route, valuable if only because the value of our lives can be defined by our daily decision to eschew it. Perhaps it is

only the knowledge that if we do not possess full control over own actions, we also cannot know ourselves, and cowardly murderers are faced with the prospect of becoming increasingly strangers inside their own heads. For some, it might well be unbearable." The cock of his head reversed itself and now canted at the opposite angle. "Overall, we feel that it is simpler to endure the execution. Either way, on our world, only cowards or those who will not put down whatever responsibilities they feel they have to their families are willing to endure this option. Most prefer execution."

In the silence that followed, it fell to Marys Kearn to ask, "And can this be done to a human being?"

Another head-tilt. "There would be some critical differences, but I cannot imagine the problem being insurmountable. In form, the technology is really very simple. If your murderer chooses to be cowardly, I presume we can be ready for the procedure within a matter of minutes, and be done within a few minutes after that."

"Thank you," Cort said. "I have one last important question. Can the procedure be rendered reversible?"

The redeemer tilted his head. "Why would you even ask this question, Counselor Andrea Cort? Is it your clever plan to immediately transport your murderer to some other location outside our control, and then defy our justice by removing the device?"

Cort smiled. "I can't blame you asking. No; I fully expect you to make sure that whatever you do to him affects him permanently. It's only because this is the first time it would have been done to human that I ask if it can be made temporary until after the effects are observed. In case of complications."

"I see. That is a reasonable concern. Very well. Be assured that the implantation is minimally invasive and that the effects, while immediate, only become permanent over time, as the brain of the prisoner forges new neural pathways. This is enough time for us to confirm that the device is functional and that there are no medical complications that demand its emergency removal. However, healing is swift. By the time the adjustment period is over, which in the case of our people involves no more than about sixteen of our days, the brain of the affected individual has become absolutely dependent on the device and is no longer capable of controlling the body without its input. At that point, removing the device results in permanent dysfunction, sufficiently severe that the patient can no longer see, hear, move or speak. You understand, however, that there are only a very few circumstances even during the adjustment period where reversing the procedure will even be considered... and that I am duty-bound to tell the Xe that you have asked the question. He will no doubt not permit this Varrick to leave our world until we are certain that what we have done to him will govern his actions for the rest of his natural life."

"Thank you," said Andrea Cort. "If we go ahead, I'll make sure we abide by that."

Later, in the skimmer, as they flew between a sky the color of slate and a city rendered no more beautiful by its growing blanket of now, Andrea Cort shuddered as if touched by a cold skeletal hand and turned to Marys Kearn, who she had been ignoring since their take-off.

"What's wrong?" Kearn asked.

Cort's voice was very weak and terrified. "Do me a favor, will you, bondsman?"

"Anything."

"If you ever think I'm in danger of using that tech to clear my record... I want you to punch me very hard."

By the time they made it back to the embassy, night had fallen. Cort went looking for Pendrake in her office, found it locked, then checked the rec room next and found it occupied by a couple of young indentures cheating each other at cards. When she finally found Pendrake, the ambassador was in the dining hall eating and in too foul a mood to tolerate disturbance, regardless of urgency. Cort arranged an appointment for two hours later and returned to her quarters, where she spent too much time under a shower heated perilously close to the threshold of pain.

At the appointed time, she dressed in a fresh black suit and went to see Pendrake.

Perhaps in compensation for her vulnerability during their last meeting, when she had been dressed down for her boxing match with a phantom, Pendrake took this one in her office. It was a shabby little place by the standards of most ambassadorial sanctums, which tended to focus on homeworld banners, displays of awards received, images of reflected glory dominated by moments spent in the company of more famous dignitaries. By contrast the walls here were plain white stone, bereft of decoration, stark in the way that the architecture of the surrounding world was stark... and they would have rendered the space cold as well if not for the heat Pendrake kept up to maximum, turning the air in the chamber to a level just short of sweltering.

As if in compensation for her spartan chambers, Pendrake appeared in full formal dress of the sort that must have been only rarely called for on this protocol-averse world. She'd pinned her hair up and affixed a holo generator cycling through her career honors and medals; a display that Cort was not about to say she'd found pathetic, because it started repeating after too short a time. She found herself wishing that she hadn't gone out of her way to antagonize this already antagonistic woman on their last meeting, when what she needed most, right now, was an ally.

Pendrake must have sensed some advantage in Cort's hesitation. "Don't waste my time."

Cort was unused to entering such negotiations in the position of a supplicant, where her own native formidability would not serve as advantage. "I... find myself in the position of needing to trust you."

"Poor you. Why?"

"We have a problem."

Warily: "Oh? How bad is it?"

"So bad that if it was just up to me, I'd use every connection I have to advocate cutting off all diplomatic relations with this world, and a permanent military blockade keeping them from ever opening trade with anyone else."

Pendrake's forehead wrinkled in disbelief. "Really."

"Yes. Really. But I've done that before, and it's not the kind of thing anybody could ever get away with doing more than once in so short a time. I'm hoping you'll take the lead on this one."

"You *are* crazy."

"I understand why you'd say that," Cort said. "I do."

"And I understand why you'd be used to it," Pendrake snapped. "It is what everybody thinks, after all. Even the people who believe in you say you're some

kind of wind-up savage. But *this*. How could you possibly think I'd go along with..."

Cort cut her off. "I know. It's the kind of position that can destroy an ambassador's career, even if she manages to sell the idea to her superiors. That kind of escalation gets looked upon as a shameful failure, even if it's justified. The ambassador I dealt with on the other occasion was permanently ruined. But this planet is such a clear and present danger to human civilization that once we're done with all obligations regarding Varrick, we need to do whatever we can to discourage any more contact with these people."

Pendrake tapped her fingers against her desk, the drumbeat turning martial despite herself. "And assuming you can even support this insanity, why should I cooperate with someone who's already threatened my career?"

"If you go with me on this, I will drop that earlier matter. I will, in fact, spin things so that it looks like you always knew exactly what you were doing in repressing this technology; tell our superiors that far from being incompetent, you were *visionary*. Your career won't advance, I'm afraid, but then you'll have to admit, it hasn't exactly been stellar. You'll be able to retire early... and I'll see to you that you get the kind of benefits the Corps only accords its most accomplished leaders."

More finger-drumming. "And if I don't want to retire?"

"There's only so much I can do, Ambassador. I'm playing straight with you here. But this is bigger than you and bigger than me. If we allow Varrick to take this treatment, and then don't repress that information, the damage we do to humanity may be catastrophic. You can count on that."

Pendrake seemed to realize what her fingers were doing and pulled them away from the percussive instrument her desktop had become.

"You better tell me what the hell you're talking about."

Cort found herself in the position of a drowning woman, struggling to reach a floating object against current that carried her farther away with every stroke. "I saw something wrong the first time it was even mentioned to me: the over-the-top sadism of the execution, offered alongside what is superficially at least a more humane alternative. I walked out of that meeting wondering: what society would even evolve such an essential contradiction?"

Pendrake shrugged. "Most human societies are built on contradictions. Like capital punishment and life imprisonment, as possible punishments for the same crimes. That's a contradiction right there."

"A limited one," Cort said. "Life imprisonment is still taking away the rest of a prisoner's life, separating him from the pleasures of comfort and family and most matters involving personal choice. It's execution of a different kind, a slow death rather than a swift one."

"I could debate that."

"You wouldn't be the first. But this is a contradiction of an entirely different magnitude: die in horrible agony, over what must feel like an eternity of suffering... or get a box put in your brain and go back to doing what you would do anyway. The very fact that few prisoners offered the choice take life has to give you pause. It *has* to. I submit that it's because Caith, raised on a world where this is a known choice, understand that such all-encompassing control *has to be* torture of a more insidious kind. I'm not sure what form that torture takes. But I'm morally certain it exists. It *has* to. Otherwise, the existence of the option, from a justice system that doesn't seem to care all that much about mercy,

doesn't make any sense."

Pendrake's expression remained blank. "I'm not sold. But go on."

"The Caith can afford to have this in their society," Cort said. "They number only thirty million or so, under only one government; they have a stable system, even if it's also a brutal one."

"But humans have many tens of thousands of worlds, administered under hundreds of different forms of government, under Juje alone knows how many local forms of corruption. What happens when news of this technology starts to spread? You think humanity's going to limit it to treating murderers?"

"I've experienced some of this personally, Ambassador. *I know*. We're the species that has tortured and murdered its own for reasons far more trivial than that: slight physical differences from the local norm. Ancestral conflicts going back centuries. Disagreements over small matters of philosophy. Sexual orientation. Gender itself. Even perversity: the sheer hunger for someone to oppress."

"You let this evil technology get out, and I'm telling you it won't be long before we start using it to control people convicted of crimes a lot more picayune than murder. Rape will be next. Why not? Nobody sane approves of rape. Might as well control any bastard prone to it. Other forms of assault? Theft? Nobody approves of that, either. Let's make sure nobody gets to do it twice! How about standing up for your rights when the government starts making intolerable demands of you? Hey, that just makes you a troublemaker! From now on, we can shut you up in a *second*!"

"And then, the human animal being what it is, it's only a matter of time before some governments start using the technology preemptively. On some worlds, children will have their implants installed as soon as it becomes a medical possibility. Entire populations will be kept in slavery, unable to do anything but what their implants, and the few privileged in charge, tell them to do. Nobody will be able to protest. They'll *want* to... but their implants will keep them grinning and complacent and cooperative in any way that their owners define as cooperation, even if they're almost insane with fury. There won't even be any possibility of rebellion. People with the implants will become commodities, sitting with folding hands while they're traded from one powerful owner to another."

"That's what this is all about, Ambassador. And everything between us aside, *that's what you need to help me stop*."

Pendrake had gone pale and stricken, in the manner of a woman suffering a terrible wound who had not yet figured what kind of weapon had struck her and how mortal the injury had been. Several seconds passed before she even seemed to realize that her mouth had fallen open. When she did, her teeth clicked.

"This..." she started, then swallowed. "Juje."

She got up, crossed the room to a functional cabinet that fit the rest of her décor as well as a tumor fits the biology of the organism around it, and came back with a crystal bottle bearing a bright orange liquid. The vessel narrowed so sharp that the aperture was almost microscopic, a function she demonstrated by wetting two glasses from her desk drawer with no more than three drops, apiece.

She handed one to Cort. "Drink."

Cort preferred to imbibe her intoxicants in solitude, but an illegal conspiracy was being forged here, and certain rituals were only to be expected.

So she took the glass, lifted it to her lips, waited just long enough to confirm that Pendrake was also going to drink, and threw it back. The three drops burned like fire as they hit the back of her throat, but in the heartbeat that followed she felt an overwhelming euphoria, as every pleasure receptor in her body fired at once.

The effect was intense and lasted only thirty seconds, before being trailed by a precipitous emotional plunge back to the cold squalor of Pendrake's office.

Cort found herself missing the brief interval of bliss as if its loss amounted to a promise that she would never know happiness again. "What the hell was that?"

"You're better off not knowing its name," said Pendrake, as she returned the bottle to her cabinet. "On the world I come from, there's a serious social problem with people becoming addicted to it. Those who use it too frequently burn out the brain's pleasure centers and can't ever know a moment of joy, ever again. I commit a genuine personal risk just allowing myself access to it—which I do only because I've found no other intoxicant that matches it. I only partake on special occasions. As a sacrament, you might say. For things like the forging of important conspiracies."

"So... we're agreed?"

"I come from the world that has forsaken unimaginable wealth by not producing that stuff in quantities that could addict the rest of human civilization." Pendrake flashed gray teeth. "So I think you can say I'm familiar with the premise of taking responsibility for the common good."

They broke for the night without resolving all the problems their little conspiracy would cause. They still had to work out a means of breaking off diplomatic relations, while hiding the reason why. They had to work out another of avoiding the humanitarian consequences of abandoning the Caiths to the uncertainties of their own fragile agriculture. They finally had to figure out what they were going to do about Varrick, who was still entitled to decide on his own fate.

None of this would be easy. Cort would have to work with Pendrake, a woman she'd alienated and considered a second-rate hack, for months.

It wasn't the most onerous task she'd ever stumbled into. But it just might have had the highest stakes.

Exhausted, aware that a terrible door had been opened and that it might now take all of her efforts to close it, she returned to her guest quarters and took care of her first order of business—a dispatch to her immediate supervisor at New London. His name was Artis Bringen, he was more enemy than confidante, and though she despised him for more reasons than she could even list, she had managed to break him in; forcing him to the epiphany that he could expect better results if he just let her have her own way. That would make prevarication here only a little easier than impossible, because Bringen was no fool.

She didn't provide details because she and Pendrake hadn't come up with any. She just wrote,

SERIOUS COMPLICATIONS.DETAILS TO FOLLOW.—CORT.

Even with a tamed supervisor like Bringen, there was no way that would ever be enough. The indenture's duty to account for every hour of every assignment meant that she couldn't just continue to stay at the site of an away assignment forever unless she could produce some defensible reason. That, like

everything else, would have to wait until she had some sleep.

For a long time she sat on the edge of her cot, her thoughts fuzzy, her stomach churning as the implications of the Caithiriin treatment stretched out before her. For a while she lost herself in one of the unhelpful spasms of selfpity that had always been part of her personal pathology. Why, she wondered, was it always so hard? Why did it have to be her, instead of any one of the Dip Corps's other fully competent prosecutors, whose routine assignments got sidetracked to such awful destinations? Then the lateness of the hour and the long day her system had spent being punished by the tension of breathing even with assistance in Caithiriin spaces began to get to her, and she found that even depression took more energy than she had.

She fell asleep without having resolved a thing, the very last thought in her head being that Pendrake had been far easier to sway than she ever would have guessed.

The metabolic aftereffects of the orange narcotic hit her less than an hour after she closed her eyes, turning an already deep sleep into a drugged one without any noticeable transition.

Had she been awake and aware that she was in danger, she might have noticed the grogginess and fought it off; even taken one of a number of counteragents she carried, to force her back to sobriety and return her capacity for selfdefense. Asleep, she welcomed the dreamlessness; asleep, she accomplished a state she rarely felt, peace.

She was therefore incapable of reaction when the door to her quarters slid open.

The first stages of Varrick's execution were by far the most watchable part of an ordeal that would only get more horrific as time went on; right now it was only a naked and terrified Varrick, strapped to a cold stone floor as the basin atop the slab that pinned him received its first few trickles of water. He would not stop screaming that this should not be happening, and was still capable of achieving volume because his breath was not even close to being constricted yet; later, Cort had been told, he would be reduced to whispers, released with what little air he could manage. Other, more awful manifestations had been described to her: the various ways the body would empty under pressure, the various sounds it would make as bones splintered and fractured; the more graphic things that would happen when the skin stretched past the breaking point finally split and began to spill its cargo of blood. That was not anything any human witness, short of a monster, would have wanted to stick around for. Cort had to look away, thinking that sometimes the sheer volume of pain in the Universe was more than the human heart could contain, and that her failures here were not just to this terrible man, but to herself.

That night Cort sat in her quarters compiling her nightly report on the progress of Varrick's execution, which was still expected to take a couple of days yet, and found that sometime during the day she'd received a dispatch from Bringen, demanding to know just what kind of complications she could possibly be talking about, with the execution already happening.

This was no surprise. Bringen was always going to be a problem. He had always treasured his position as the man holding her leash, and indeed professed a kind of affection for her, even if that affection had more than once taken the form of outright opposition. He still knew her better than any other

human being; a fact she considered appalling, because she did not want to be known by anybody.

She cast about for a fiction that might stand a chance of satisfying him, and finally wrote:

YOU GOT ME.I CONFESS.THERE ARE NO "COMPLICATIONS."

YOU WANT TO KNOW THE REAL ANSWER,ARTIS,I'M TIRED; MORE TIRED THAN I'VE EVER BEEN; EVEN MORE TIRED THAN I WAS AFTER BOCAI.

THE FUTILITY OF THIS ONE GOT TO ME.THE MAN WAS DOOMED BEFORE I EVEN GOT HERE, DOOMED IN LARGE PART BY HIS ESSENTIAL NATURE, DOOMED BEYOND ANY HUMAN MEANS OF REACHING HIM.IF HE HADN'T COMMITTED HIS IDIOT CRIMES HERE, HE WOULD HAVE COMMITTED THEM SOMEWHERE ELSE,AND DAMNED HIMSELF IN SOME OTHER MANNER—PERHAPS EVEN WHILE UNDER THE JURISDICTION OF SOME OTHER GOVERNMENT CRUELER THAN THIS ONE.

THE SADDEST THING IS HOW AVOIDABLE IT WAS.WE KNEW ABOUT HIS CRIMINAL PROCLIVITIES FROM THE VARIOUS OFFENSES HE COMMITTED AT HIS EARLIER ASSIGNMENTS,BUT BECAUSE OF THE TIME-DEBT HE OWED TO THE CORPS,WE SATISFIED OURSELVES WITH SLAPS ON THE WRIST AND CONTINUED TO PLACE HIM IN POSITIONS OF GREATER AND GREATER RISK.WE TESTED HIM TO DESTRUCTION,UNTIL HE WAS DESTROYED.

I MAY HAVE FELT THIS MORE THAN I FEEL MOST OF THE CASES I WORK ON,BECAUSE I HAVE SO MUCH IN COMMON WITH HIM.BUT IT'S GOING TO TAKE ME A WHILE TO ABSORB THIS.IN THE MEANTIME,THE EMBASSY HERE NEEDS A LITTLE LEGAL WORK,INVOLVING CERTAIN MINOR DISPUTES BETWEEN US AND THE LOCALS—AND THOUGH I'M OVERQUALIFIED TO HANDLE THEM,I FEEL I CAN BEST OCCUPY MY TIME HANDLING THOSE TWO-FINGER EXERCISES, WHILE FIGURING OUT WHAT ALL OF THIS MEANS FOR MY FUTURE.YOU'LL HAVE THE REQUEST FROM AMBASSADOR PENDRAKE UNDER SEPARATE COVER.SHE'S A GOOD WOMAN, AND SHE'S BECOMING A GOOD FRIEND.

I HOPE YOU'LL FORGIVE ME FOR THIS,AND I WANT YOU TO KNOW THAT I REGRET ANY DISAPPOINTMENT YOU MIGHT FEEL IN ME.

YOURS IN FRIENDSHIP,ANDREA

She read the document three times before confirming that she had done the best she possibly could with it, then shuddered and forwarded the text to the Ambassador.

It wasn't long before she got the return message that Pendrake wanted to see her, shuddered again, and smoothed out her black suit before traversing the three short hallways to Pendrake's office.

Pendrake was not dressed formally this time, but was instead wearing the sweaty workout gear indicating a recent session with the simulated boxer. The text of the missive to Bringen hung transparent above her desk, glowing green everywhere she'd highlighted a phrase for special consideration. Emerald highlights shone in the sweat on her cheeks.

She said, "What the hell is this?"

Cort said, "It's my letter to New London."

"I can see that, Andrea. I just read the damn thing. I'm just wondering if you think I'm stupid."

Cort wanted to tell the woman that the answer was yes, that in her estimation she was stupid, that it might have been a form of stupidity that went

along with cunning but it was still a bone-dense, opaque blindness that limited her concerns to her own personal ambition and relegated everything else to mere annoyance. She also wanted to leap over the desk and teach this creature, so addicted to unfairness that she limited even her simulated fights with constructs prevented from fighting back, what it meant to anger someone who, unlike her, had more than once needed to actually fight for her life. But she did neither. Instead she said nothing.

"You must think I'm stupid," Pendrake said, "because you treat me like I'm stupid."

Cort wanted to say that of course she treated Pendrake like she was stupid, because in any sane and ordered universe it was the way Pendrake would always be treated. She wanted to say that if it was up to her Pendrake would have been strapped down and forced to endure having the word *Stupid* carved into her forehead with a dull knife. She wanted to say that if it were up to her she would have held the blade herself. But she did not do that. Instead she said nothing.

"I've experienced your way of speaking to people first-hand," said Pendrake. "Why would you think me capable of believing that this *warm* and *polite* note accurately reflects the kind of communication somebody like you would *ever* have with anybody responsible for giving you orders?"

Cort wanted to say that not everybody she dealt with was garbage in human form, and that she respected Artis Bringen quite well, thank you, but that would have been a lie and the words that came out of her mouth were, "It's the way I talk to people now, Ambassador."

"Well, that's the problem, isn't it? It doesn't sound anything like you."

Die screaming. "No."

"Thank you for your honesty," the ambassador said. She went to her cabinet and removed the familiar, now-hated, bottle of orange liquid, squeezing four drops into a glass. "Drink."

No, damn you. I won't.

She drank. Again she felt that burning rush, and again the subsequent warmth flooded her, banishing all the despair of the last few days and filling her heart and lungs with a pleasure she had already begun to crave to a degree that horrified her. For seconds that seemed to last hours, everything was all right in the world. Under the influence, even the state of terror she'd lived in for days now was comforting: for what is more promising, really, than freedom from having to make decisions?

Then the pleasure ebbed, and she was once again returned, with a thud of despair, to the cruel reality of imprisonment.

Pendrake's smile was kind. "It's really that simple. Life is punishment *and* reward. Sometimes *both* punishment *and* reward, at the same time. It's reward, now, because it's all you have. It's punishment because you know that if you taste it too often, you will lose even more of yourself than you've already lost. Too much reward and punishment is no longer a threat; too much punishment and no amount of reward is ever solace. But when reward *is* a punishment: that's about as eloquent a subsidiary behavior-modification a system as anyone could want. You're afraid of being given more, aren't you?"

I'll kill you blind you burn you to ashes. "Yes."

"Well, then, you know what to do. Tonight you'll rewrite that letter, editing out the warmth so it sounds a little more like you. And then tomorrow morning

you'll come back to me and we'll have another strategy session. Okay?"

If I could kill you now I'd—"Okay."

"Good girl. And while I'm at it, make yourself more evident at mealtimes. The recluse thing isn't quite working for me. It makes you too mysterious, encourages the asking of questions. Be more sociable. That's an order."

Cort nodded and even found her lips curving into an unwanted pleasant smile before she turned her back and began the long walk back to her quarters, somehow a greater distance even though it was not far enough, would not be far enough even if it encompassed the gulf between here and the very edge of Confederate Space.

Every step was a futile exercise in hammering away at her personal walls. She could not stop focusing all the hatred she had, which was considerable, at the priorities that drove her meek return to the little room where all her energies would be kept focused on following orders. Rebellion was built into her. It was who she was. It also wasn't what currently drove the body she inhabited, the body that she was imprisoned in. That was another mind, one she couldn't access.

There was, she'd found, no moment of the day she wasn't aware of it. Even when the neutered copy that drove her chose to do what she would have done anyway, the steps she took, the gestures she made, the words she spoke, were not *hers*. They were actions that paralleled hers, rendered maddening by the subtle yet tangible disconnect between her will and the acts that will directed but could not affect. That was not her rolling over in bed; that was not her taking an early-morning trip to the bathroom; that was not her swallowing after her mouthful of food had been chewed the preferred number of times. That was a being who lived parallel to her, a being who happened to want to do many of the same things but was not a reflection of her own volition, a being who was Andrea Cort without any of the things that made Andrea Cort.

Cort had come to realize that even her few pathetic attempts at rebellion, like the uncharacteristic tone of her missive to Artis Bringen, were not her. They were that other controlling version of her, having the same idea she had but not finding any particular reason to differ with it.

Pendrake had picked up on this at once and had wasted no time turning to the reward/punishment of the orange narcotic to discourage the controlling mind from taking steps even as miniscule as that. It was, like Andrea herself, a fast learner. It wasn't stupid. It would give up before long.

She returned to her quarters, closed the door behind her, and lay on the bed fully clothed, her eyes fixed on the ceiling.

Returning to her room wasn't rebellion. She'd been ordered to.

Lying on her back wasn't rebellion. Pendrake had said *tonight*, and this was still local afternoon. As long as it got done by tomorrow, the controlling mind had no problem with her following her moods.

Furious concentration wasn't rebellion. It didn't affect her actions. It was also the only weapon she had, even if it also turned out to be the reason why the Caith treatment was indeed what she'd suspected, not a humane alternative but an even more vicious punishment, the vicious internal torment that now threatened to damn her to hell throughout the rest of her days.

All she could do was think. And so she thought, hating that the only place her concentration took her was the same path she'd already traveled half a dozen times since waking up in the Caith facility with her will stolen from her.

Pendrake, she'd realized, might not have had the idea right away.

Upon being confronted with the truth, Pendrake might have seen the very same problems Cort herself did. She might have indeed agreed with her that it had to be kept out of human hands, even at the cost of her career.

Even when she brought out that orange intoxicant, she may have meant it as nothing more than she represented it as being, a sacrament to lubricate the agreement between two conspirators.

But then Cort had left her office, agreeing that the problems here were too complex to resolve all at once, putting their next meeting off to the next morning.

And that most self-involved, angry mediocrity known as Ambassador Virila Pendrake had done something that Cort would have imagined most uncharacteristic of her.

She had continued thinking.

She had thought:

Wait.

Why do I have to let that bitch destroy my career?

There's no reason for that.

If I get her on my side, I might be able to salvage this.

And then she had thought:

Hell, I might be able to do more than salvage this. I might be able to profit from this.

And then she had thought:

Humanity's had any number of other awful methods of controlling people, and survived. If I leave here with their treatment in my possession, I could find somebody willing to buy it. I could sell it for more than anybody could spend in a thousand lifetimes. I could live like a queen. I could be a tycoon, a Bettelhine.

The worst of the repercussions won't even be worth worrying about until I'm long gone.

There would have been some idle, pleasant daydreaming about castles and servants and all the luxuries she could possibly imagine for herself, swelling to suit even more grandiose visions as she lay back in her chair, and teased herself with the possibilities.

But then, of course, her thoughts had circled back to Cort.

If only there was some way to stop her.

Followed by the inevitable thunderbolt:

Juje. There is.

She's a war criminal.

She's a killer.

She's been written up for insubordination, any number of times.

She's practically living under a deferred sentence, even now.

What would it cost to just incapacitate her in some way and take her to the Caith, with the facts all laid out to support what they would consider a very reasonable request?

I can take care of her, and Varrick, at the same time.

In fact, it'll be downright easy.

I can imagine it right now.

I contact the Caith authorities.

I say, "You can have Varrick. He's decided to take the sentence of death. He'll likely panic and change his mind once it starts, but you know how it is. All decisions are final."

That takes care of that loose end.

Then I go on to say, "And while you're at it, you should also take this one. She's a prime candidate for your treatment. Here's full documentation. As you can see, she has quite the record. Murder and everything. Made trouble for herself, and for others, wherever she was posted. A genuine danger to the social order. We've been wondering what to do about her for years.

"No, we don't want to kill her, not exactly, because she is a talented little thing, and those talents are quite useful to us, as long as they're properly channeled. All we want you to do is make sure that she's no longer a threat to anybody, ever again. Take her violent tendencies out of the equation. Also make sure she can't rebel, or disobey direct orders.

"On whose authority? My authority. You know me. I'm the ranking Dip Corps authority on this planet. You can make me responsible for her. Come on. You've seen her records. She deserves this. The only reason we've never executed her is that she's been of use. This way, she can continue to be of use."

It wouldn't fool a human. Not most humans. Not most smart humans.

But it might fool somebody who doesn't quite know how human beings think, who doesn't quite know how human society works. The Caith barely tolerate us. They pay as little attention to us as they can get away with.

They can be manipulated into doing what I want.

Andrea's heart hammered hard as she thought about what had to be Pendrake's next thought.

As far as the human reaction: who would even notice? Cort's a notorious misanthrope. She's crazy. She has no friends. Nobody's ever going to say that anything's out of character for her... especially not if I make sure she transfers to permanent duty, under me.

She would be the perfect advisor. Brilliant, in her way. Logical.

Loyal.

I could be certain that she'd never rob me or hurt me, or betray me.

This isn't a daydream any more. This is a plan.

Juje. I could do this.

I should do this.

It would take care of everything. Varrick Cort. Keeping a lid on their tech until I work out a way to obtain it for myself and a means of selling it elsewhere, things that Cort will be able to help me with. Not to mention revenge against the insufferable bitch for threatening me: a not inconsiderable reward in and of it self, since if I do this I can make sure she regrets drawing breath every single day for the rest of her life.

This is perfect.

This is what I'm going to do.

And so Pendrake, having talked herself into forsaking whatever moral qualms she might have had, had waited until she could be reasonably certain that Andrea Cort was asleep, made sure she remained out by administering another of what Cort now suspected to be a quite extensive personal collection of recreational narcotics... and taken her. It had been late at night, all the indentures asleep or otherwise retired to their rooms, and so she'd suffered absolutely no difficulty getting Cort down to the skimmer bay unnoticed; no problem leaving with her, unnoticed; no problem leaving her in the skimmer unconscious; no problem, given the minimal Caith sleep schedule, of getting in to see the Xe; no problem having the conversation she had already rehearsed

with herself, promising the delivery of Varrick and obtaining the Xe's order for Cort's treatment; no problem rendezvousing with the redeemer, who had no particular reason to question the dictates of the Xe and the world's ranking human; no problem standing by as Cort's personal volition was stolen from her; no problem after that returning to the embassy, a much-changed Andrea Cort in tow, without anybody ever realizing that she and Cort had been gone.

It was in the returned skimmer that Pendrake administered the counteractive drug that had roused the horrified Cort to a different world and said:

You thought you were so smart, you bitch.

But you made a mistake.

You assumed you were smarter than me.

You assumed that just because I'm stuck at a dead-end post, that I live without ambition.

Neither of those things is true.

Starting tomorrow, we're going to start working on that.

From this day forward, you work for me.

Lying in bed for those afternoon hours, thinking of all the foolish mistakes she had made and all the lost and helpless years that she was about to live because of them, Cort made only four discoveries of note.

The first was that none of this obsessive circling about events still raw in her memory did her a damned bit of good. It was just self-flagellation, the endless poking at a wound to punish herself with the pain she deserved. It took up time she couldn't afford and left her, longer than she could bear to think later, in the same trap she'd stumbled into before.

The second was that, as long as she was alone and nobody could see her, hysterics remained within the options the device making her decisions was willing to duplicate for her. The tears didn't just fall, they flowed. They burned her cheeks on their way down, endless numbers of them, more than she had managed to release in years; but though she shuddered and sobbed and whispered to herself that she didn't want to live like this, none of it was at all cathartic. Only the tears, an involuntary function, managed to be genuine. Everything else was the transcription, acting for her, doing what it correctly calculated to reflect the real Andrea's feelings and desires... without ever quite being her; without ever quite accomplishing emotional release. It only added to the torture.

The third discovery was a corollary to the second. This, she realized, would only get worse. It was built into the treatment. The transcription of her mind had only reflected her state of mind at the moment the copy was made. It was capable of learning, and incorporating new information, but it would never grow. It would never alter its behavior to reflect changes in her mindset over all the years to come. Even if she was screaming inside, even if she longed for death, even if she went insane, the transcription would remain the same thing it was. The differences between what she wanted to do and what the transcription wanted her to do would only get worse, until she became an alien to her own body, a prisoner forced to live out a stranger's life.

It would be different, she supposed, had the treatment actually qualified as *mind control*, had it altered or changed or in some way modified her thinking process. She lived inside her own head and could think of any number of ways

where, if that were even possible, she would have not only approved but actively sought out such adjustments. A happiness pill, for instance, would have been nice. But here, the mind she had always lived with still existed, and was just as self-cannibalizing as it always had been. It had just been rendered impotent, an irrelevant ghost shouting at the confines of her skull, with nothing to do but rage as her body's strings were pulled.

It was as cruel a punishment as any she had ever encountered, and it was designed to get worse. *Someday, she thought, maybe in a year, maybe in ten, I'll look back on this day and think I was foolish for imagining this had gotten as bad as it was going to get. Someday I'll regard this as paradise...even if I'm still capable of thinking, by then. If I'm not a mindless, gibbering madwoman inside.*

The fourth discovery she made was that she didn't even have the option she had often exercised in life, of being too upset to be hungry.

At a certain point, after hours of coming no closer to a means of escape than she had been when she first placed her head on her pillow, the transcription reacted to the hour and decided that she had better get up and start getting ready for dinner.

She didn't want to eat. She certainly didn't want to face other human beings. But she had been ordered to mix, and so, with every ounce of will in her body screaming *no*, she sat up and went to the room's shower and washed away the worst of the damage the afternoon's weeping had had on her face. Then she went to her bag and removed the cosmetics she carried out of habit but rarely used to reduce the puffiness around her eyes, restoring them to their usual penetrating look.

To her own examination, the figure in the mirror did not look like her. The eyes did: they looked forlorn and lost. But they also looked like they were peering through the holes in an edifice shaped like her, that moved and acted like her, that was otherwise a jail cell with spikes on all the interior walls. She recognized nothing but those eyes.

She would have lingered at the mirror, and likely begun weeping again, but then, against her will, her body began to dress.

The embassy's communal dining room was a functional space where the night's offerings were served on buffet tables and claimed by indentures who gathered at various four-sided tables. Apparently there was no set eating time, because there were only a few indentures present, all at tables where every seat was taken. As a small mercy, Pendrake was nowhere to be seen; she either didn't mix with these lowly representatives of her will, or she preferred to eat at some time other than the schedule followed by these particular people. This didn't mean that Cort wouldn't have to eat opposite her, behaving herself, any number of times in the days and years to come: a prospect she found nauseating.

Driven to nod at the few embassy personnel she'd met, who no doubt saw her as a prime mover in the still-ongoing execution of their colleague and had no particular desire to pursue conversation, Cort made her way to the spare buffet and selected a few items that looked edible enough. She didn't care about the flavor, and in fact doubted that she'd taste any of it. The command was to eat. When she had a sufficient assortment of foods her legs carried her back to an unoccupied table, where, once she sat, her hands began the mechanical task of feeding her body with nutrition.

She was about a third of the way into the meal when other hands lowered a tray before the seat opposite hers. "Hello, Counselor. Do you mind?"

Cort's preference for dining alone, already violated, did not manifest itself in the transcription's controlled response. "No, of course not. Sit down."

Kearn sat, flashing her a quick smile that turned somber almost at once, as she remembered the reason Cort had come to this planet in the first place. She looked different wearing clothes appropriate for the temperatures inside the embassy than she had traveling around Caithiriin's frigid natural air; looser, friendlier. She'd released her curly hair from its binding and freed it to dangle to her shoulders on both sides of her fresh, heart-shaped face.

She said, "I still can't believe he chose the way he did."

Cort wanted to say (and surprised herself by actually saying), "I'd prefer not to talk about it."

"I understand. No shop talk at dinner." Kearn stabbed at her meal with a fork. "I heard you'd be staying on for a while. I'm glad."

Cort wanted to say (and surprised herself by actually saying), "You are?"

"Sure. Why not? A place like this, we can all use somebody new, once in a while. I guess you're the newbie, now. And that's not bad. You're not one tenth as awful as you encourage people to think."

Cort wanted to scream, *Are you blind? This isn't me! This isn't even close to being me! This is a meat puppet with me trapped inside it! Look past my face, you stupid cow, and see what's actually there behind it!* Instead, not raising her voice at all, she flashed a warm grin and said, "Don't tell anybody."

"I won't. What did make you decide to stay, anyway?"

There had to be something she could say. It couldn't be anything overt, because the transcription mind would reject anything overt in favor of a response much less revealing... but she had already noticed that it didn't balk at small rebellions. There had to be an idea she could come up with, that the transcription would also come up with and find innocent enough to pass on.

She said, "I suppose I'm tired of traveling."

"I can understand that," Kearn said. "But why stop here, of all places? New London's civilized. Somebody like you could have gotten an administrative job there and spent her off hours enjoying herself."

Something. Anything. It doesn't have to be anything big. It can be small.

"You're crying."

Tears had indeed spilled, but Cort found her self flashing a reassuring grin, utterly at odds with the screams taking place inside. "It's noth ing. Just tension. The result of a bad day."

"The worst," Kearn agreed, buying the explanation, not following it to where Andrea Cort would have sacrificed one of her arms to lead her. "It's got to be hard, to lose a life and wish there was something you could have done to save it. One reason I could never imagine doing what you do."

No! I don't want you to sympathize with me! I'm only three feet from you! Make the leap! See what's in my head!

Kearn selected a vegetable strip from her plate, dipped it in the white sauce that went with it, and bit into it, swallowing before she went on. "But, again: why leave New London?"

New London was Cort's home. She was not comfortable there because she was not comfortable anywhere; but the city was the place she knew best, the place she'd come to consider home base in spirit as well as profession. She found herself saying, "I don't like it there."

Kearn frowned. "You like it here more?"

No! "Not really."

"But you transferred here. To a post where you'll have next to nothing to do."

Not willingly! Dammit, see!

Cort's shoulders shrugged, without her consent; her hands made a fluttery *so-what* gesture, without her consent; her mouth released a noncommittal grunt, without her consent. Her vision blurred again, as more tears spilled. "Maybe I'll find more to do here than you think."

The bridge of Marys Kearn's nose wrinkled, as her brows knit in an expression of extreme dubiousness. "These are very... short answers coming from you, Counselor... and you're crying again. Is there something I'm not authorized to know?"

Yes! "Yes."

"Does it have to do with the treatment?"

Yes, dammit! See it! See what's going on with me! "I can't say."

Cort stabbed at her meal with a fork, acquired a bite-sized morsel, and brought it to her mouth, her jaw moving up and down as if without any sense that nutrition was being absorbed. It was not bad food. Whoever handled the job of preparing it had known what to do, to bring out the flavor, to maximize the pleasure that a talented hand could wring from even the simplest ingredients. But the satisfaction of a meal felt a million light years away.

Cort could focus on nothing but the three little wrinkles that now stabbed upward from the bridge of Marys Kearn's nose, as the knitting of her brows became persistent.

"Is there anything you can tell me?" Kearn said, at last.

Something. Something small. A tiny idea the transcription could have too, that its filters would not see fit to censor.

And then Cort had it: a word so tiny and yet so blatant a clue that she despaired of hearing it come from her own lips.

It stunned her by arriving. "Well, let's just say that I can't."

See it! See what I'm telling you!

Kearn's forehead-wrinkles smoothed, as she retreated. "... okay."

The two women spent the next minute dining in companionable silence, Cort screaming inside, and Kearn concentrating on her meal, no doubt casting about for something else to say. Cort feared that that she'd blown whatever last chance she'd been given, aware that even as she sat here compelled to pretend that nothing was wrong, her brain matter continued to rewire itself, bringing her closer and closer to the time when there would be no means of escape.

Then Kearn's gaze flickered toward her again. "You know," she said, "you may be tired of it, but I've always wanted to see New London, just once. Talking to you might be as close as I'll ever get. What's it like?"

Say it! she begged the transcription. *Have the same idea and say it!*

"Well," Cort said, dragging out the word, "it's a cylinder world, you know. Central sun along the hub, a planned garden of a colony around the outer rim. The horizons curve upward, everywhere. But there's green, everywhere you look... and it's always warm, except for a couple of planned winter days, a few days per calendar year."

Kearn ate another veggie stick. "You must like that."

"Well," Cort said, wishing she could give the word more emphasis, and despairing at the degree to which the mind running her body flattened it,

“what’s not to like? I love that it’s the middle of everything, the center of the whole human race, or at least as much as one as we allow ourselves to have. I’ve never liked crowds much, but I love just walking from my little apartment to the Corps headquarters, on surface streets; seeing all the different kinds of faces around me, knowing how different people are, wondering how many different cultures they come from. It’s... *well*, it’s enough to make me overlook all the terrible things we sometimes do to one another.”

The three little lines at the bridge of Kearn’s nose had reappeared. “But you just said you *didn’t* like it there.”

Come on! Do I have to say “well” another two dozen times before you get it?

“I’m not fond of the company,” Cort said.

Then either the imperative to conceal her condition or the order to get her work done tonight kicked in. It was impossible to tell which. The transcription had its own reasons, reasons it had no particular reason to share with her. She found herself flashing the most disarming grin possible *no* and standing up *no* and picking up her tray and saying, “Anyway, this has been great, but I just remembered I have an assignment to finish before I go to bed tonight,” the nonsense just spilling from her without her input, “I hope we can make more time for this later,” *stop it stop it stop it*, a few more inconsequential pleasantries spilled before her legs carried her across the room and her arms dumped the remains of her half-eaten, barely-remembered meal into the disposal bin, both without any input from her, *no*, an abyss of absolute madness opening up before her, her sanity starting to crack at the edges, until she felt a gentle hand on her shoulder and was turned against her will to find a stricken Marys Kearn saying, “If I’m wrong about this, I apologize, but I’m afraid I have to punch you in the face.”

Cort watched as if from a million miles away as Kearn drew her arm back, telegraphing her blow in the way an inexperienced fighter does, and inside she could think of about a dozen ways she could evade or block the attack with ease. Anger flared in her, the way it always did whenever violence was directed her way.

Instead she watched and did nothing as the fist came right at her, a missile that she should have had no difficulty dodging.

Instead, it impacted without meeting opposition. Cort hit the floor hard, aware as she rose with blood on her lips that half the indentures in the room had risen to their feet, aghast at the sudden injection of violence into their quiet meal. Marys Kearn stood above her, massaging her closed fist in the manner of a woman unaccustomed to violence who had just discovered, for the first time, how much solid punches can hurt those who hurl them.

Andrea Cort turned to the others in the room and said what, in this particular circumstance, she might have said anyway. “Don’t worry about it. This is a private matter. It’s not going any further than this.”

Then she stood, dusted herself off, and faced Kearn, thinking one more thing, *say one more thing, give her one more thing to let her know she’s right. Just one more thing.*

Something that obeyed the transcription’s imperative, of defusing violence without further engagement.

“You’re right,” Cort said. “I deserved that. I apologize.”

Then she smiled.

“Well, I’d better head back to my quarters now. I have work to do.”

The next few hours were the longest in a life that had known any number of agonizing waits. Rewriting her dispatch to Artis Bringen took only a few minutes of it. The rest was spent agonizing over what she otherwise had no means of knowing, what must be happening elsewhere over these long and excruciatingly isolated hours. Had Kearn jumped to the wrong conclusion? Did she think that Cort had done this to herself? Would she be stupid enough to bring her suspicions to Pendrake? Would somebody bring Pendrake the news of the incident in the dining room, giving her the warning she needed to protect her crime from the only person in a position to figure it out? If so, was Pendrake already working out some kind of charge she could bring against Kearn, to justify having her fixed in the same way Cort had been fixed?

Torture. Hours spent screaming inside, while the second mind making Cort's decisions for her saw to it that she behaved herself and spent a quiet evening, finishing her letter, organizing her thoughts on the matter of the agenda Pendrake wanted her to pursue, listening to some music, and then finally, without any fuss at all, lying down to sleep.

She did not, of course, actually sleep.

She just lay in bed, obeying the pattern of behavior she would if she were asleep, her eyes closed against her will, the terror inside her building until she craved the release of death.

The next morning, she rose on schedule, showered, then dressed and went to the dining room for breakfast. Nobody sat with her, though Marys Kearn walked in once, met her gaze, then shuddered and walked away, foregoing the meal. Cort took her time over breakfast and bussed her table in time for her early-morning meeting with the ambassador, actually arriving a few minutes early, which obliged her to stand at the door, patiently waiting.

As it turned out, Pendrake was a few minutes late getting to her own office that morning and arrived carrying a coffee cup and a malignant smile of approval. "Glad to see you're so prompt. I approve of that quality."

Cort's answer was polite and respectful. "Thank you, Ambassador."

They went inside, where Cort stood with folded hands while Pendrake made herself comfortable at her desk and called up the text of the letter Cort had edited on her instructions the previous evening.

It took Pendrake all of thirty seconds to make her way through it. "Well, this is much better. I see a couple of points that might benefit from tinkering, but nothing really worth complaining about. Together with my letter, this should take care of any further questions your Mr. Bringen might have."

"I'm afraid we're not finished, though."

Pendrake frowned. "What's the problem?" "I was not satisfied with this draft and pro-

"I was not satisfied with this draft and produced another one early this morning."

The ambassador rolled her eyes. "You should have shown me that one first, then. I don't have time to waste reviewing every piddling little step you take between the initiation of a project and its successful completion."

"I'm sorry, Ambassador."

"That doesn't give me back my wasted time. Where is it?"

Cort tapped her hytex link. "Here it comes."

The holographic text above Pendrake's desktop flickered as the old version was replaced with the new one. Even before it hung there long enough for a single word to be read, it was visible as a different draft, because it consisted of four paragraphs longer and denser than the ones Cort had completed before going to sleep.

Pendrake had time to sight-read several words in the first sentence before she looked up, a terrible comprehension dawning in her eyes. She leaped up with enough force to send her chair toppling backward to the floor. The fight-or-flight impulse settled on *fight*, and she circled her desk in a frenzy, launching herself at Cort in an attack that she must have thought her superior bulk guaranteed victory.

What followed was downright embarrassing.

In her life, Cort had defended herself against murderers of flesh and blood. She had absorbed blows and retaliated with more punishing ones. She'd entered this room expecting no challenge, and now experienced no challenge, taking down a woman whose familiarity with combat was limited to a holographic simulator at a beginner's setting. She sidestepped the wild lunge with ease, robbed Pendrake of breath with a blow to the throat, robbed her of balance with a heel to the ankle and of fight by seizing the hair in the back of her head and driving her face forward into the desktop.

She might have done a lot more than that, given the opportunity, but that's when Marys Kearn and the two male colleagues she'd enlisted to the cause came running in, their own fists raised, prepared to intervene if by some chance it had been Pendrake who won the advantage.

The three of them stared at the scene they found: a dazed Pendrake on her hands and knees, bleeding from a fresh gash in her forehead, a furious and red-faced Andrea Cort towering over her, trembling with hunger for some excuse to hurt her some more.

"Well," Kearn said, without thinking. Then she heard what she had just said and winced. "That was pretty definitive."

"The physical confrontation was moot," Cort said. "It was never going to be a problem."

"I can see that," Kearn said. "I'm sorry I doubted you."

One of the men behind Kearn said, "Still need us?"

"Not here," she said without looking at him. "Wait in the hallway. Keep anybody else from coming in. You don't want to get any more involved in this than you already are."

Despite everything Kearn's two friends had been told, and despite what they'd witnessed with their own ears the previous night, she was correct. This was still a mutiny... and it was far safer being at the edge of a mutiny than at the center of it. They left with relief, closing the office door behind them.

Cort circled the desk and read the floating text. "ATT:ARTIS BRINGEN.BELOW YOU WILL FIND DOCUMENTATION OF A NUMBER OF SERIOUS CHARGES I WANT FILED AGAINST AMBASSADOR VIRINA PENDRAKE OF THE CONFEDERATE MISSION TO, blah, blah, blah, RELIEVED OF DUTY, blah, blah, blah, GROSS MISCONDUCT, blah blah blah, and so on." She tapped the hyltex connection at her throat, flicking the letters off, before coming back around the desk to face the kneeling woman with folded arms. "In case you haven't figured it out, that means you're under arrest, you intolerable bitch."

Pendrake moaned, rubbed her injured forehead, and glanced up at her two

scowling captors, seeking room for negotiation and finding none. "When... did you...?"

"Last night," Cort said. "Long after everybody else was asleep. Same time you picked, the night you fixed me. Marys enlisted help and together with her two friends outside overpowered me, drugged me, and got me to the *Xe*. He turned out to be very upset when he found out that Confederate law didn't sanction your personal version of justice. He had no problem ordering the immediate emergency removal of my device."

"I was afraid he wouldn't," Kearn said. "I thought he'd take too much satisfaction in ordering the treatment for a human, any human. It turns out that he also has a sense of honor... or self-preservation, if you prefer. The last thing he wanted was to be the center of his own diplomatic incident, when your over-reach was reported. He was *eager* to help. He even apologized."

Cort's could barely contain her fury. "And they got it out of me barely in time, too. I only *just* survived the procedure. You know what the redeemer told me, afterward? That it turns out human beings grow their new neural connections a lot faster than Caith do. I was supposed to have another week left. The redeemer said I would have been beyond help in another forty-eight hours."

Pendrake's terrified gaze was now flickering from Cort, to Kearn, and back again, as if driven to debate over which of the two constituted the bigger threat. "B-but... how did you even manage to tell her..."

Cort saw no reason to go into all the things that had gone right with the conversation in the dining hall. "Information's like water, Ambassador. It cuts its own channels, no matter how carefully you try to contain it. Given the impression she'd formed of me on our one day together, and our briefing on the Caith treatment still fresh in her mind, Kearn here was able to discern what was wrong with me in one brief conversation. I'm just fortunate that she could also figure out that you were not the one to ask for help."

Kearn's righteous fury was a less evolved version of Cort's own. "That much was easy, Ambassador. You were the only person who stood to benefit from the Counselor staying on. Plus, if you don't mind me saying, I had a bad feeling about you from the first moment I met you."

Cort flashed one of her rare uncomplicated smiles. "Yes. It appears that Marys here is wasted in her current career path, not when she could be a lot more useful in the prosecutor's office. She has a frightening knack for discerning patterns and turning tangled evidence into straight lines. I intend to talk her into requesting a transfer and sponsoring her training in my department. I think she'll find the work, not to mention the environment of New London, a lot more enjoyable than her position here."

Pendrake moaned again, rubbed her head some more, and said, "Varrick—"

"Oh, him? I'm actually glad you mentioned him. He's the single detail that leaves you most screwed. The *Xe* informed us during our visit. It turns out that your resident murdering thief was on the extreme lower end of the survival spectrum, and lasted only about a fourth as long as expected. It wasn't so much the growing weight, which may not have even been uncomfortable yet, so much as the unrelenting terror. A few hours of staring oblivion in the face and the poor sick son of a bitch pretty much jettisoned his will to live. The *Xe* said it happens sometimes."

As if in hunger for some form of justification she could find in all this, Pendrake blurted, "He was going to die eventually anyway."

Kearn made a disgusted noise and looked away.

Cort said, "True. But your understanding of the Caith rivals your understanding of ethics for sheer idiocy. They're not without their own capacity for moral outrage. True, the man was already sentenced to death—and yes, granted full understanding of what the Caith treatment entailed, he might well have chosen that death as his preferred alternative—but by handing him over to the Caith under false pretenses, you turned an execution planned by the state into your own personal killing of convenience. The Xe was most upset to find out that you'd taken such terrible advantage of him. He didn't appreciate being reduced to a weapon in your hands. He was so upset, in case, that he intends to charge you with murder."

Terror flared in Pendrake's eyes. "That's a stretch. I'll fight it."

"Sure," Cort said. "You can do that. That's your right. You might even win. But then what happens? You take one step out of their jurisdiction and find yourself facing Confederate law next."

"And there, Ambassador, your situation becomes far worse."

"The instant you're in my power, I see to it that you get charged not just with murder, but also with assault, kidnapping, false imprisonment, and slavery. Maybe half a dozen other serious charges; I haven't compiled a full accounting yet. In order to make them all stick, I'll be forced to tell my superiors everything that happened here, and that'll get you declared such a security risk that any sentence you receive will be spent in the kind of place where we only send people too dangerous to ever be permitted any further contact with other human beings."

You'll spend the rest of your life locked in a windowless cell, with no way of telling the difference between night and day, nobody to talk to, nothing to do but feel your mind fragment. I promise you. For you, Caith justice is better. You might as well surrender to it."

Pendrake heard this, and absorbed it, and clung to one last hope: "You don't dare. If you tell your superiors, word gets out. If I go on trial here, I'll make sure word gets out. Either way, people will find out about the treatment. Everything you were afraid of will come true."

"Also correct," said Cort. "Either way, billions suffer. But if those are the only options, then at least we're comforted by the knowledge that the human race now encompasses trillions. For everybody who suffers because this technology gets loose, there'll be others who still manage to escape it; others still whose worlds will refrain from using it. As a species, we've swallowed fouler medicine and survived. As a species, we'll survive this."

"And on top of that I have to consider: right now, *you're* the most pressing threat. If you're not removed with all possible haste, the word gets out anyway. Everything will be just as bad, with the extra added intolerable consideration of you getting away with what you tried to do."

"And besides," she said, her voice taking on the chatty tone of a shared confidence, "I really do think you underestimate just how much my hatred for you factors into my decisions, now. I don't retain much of a rational sense of perspective at the moment. After what you've done to me, I find seeing you get what you deserve more pressing than what *might* happen to billions. I'm willing to take the risk. Trust me. I'm almost eager for it."

Pendrake lowered her head and sat shaking for several seconds until the time for bargaining began. She appealed to Kearn, who had stood apart during

the entire recitation, wearing a face just as stony as the counselor's. "Can't you help?"

Kearn's voice was a symphony of eloquent loathing. "Why would I even want to?"

"You can't take this as personally as she does. You have to see what she's risking..."

Kearn shook her head. "I think I'm the best judge of what I'm willing to take personally, Ambassador. I like her. And I don't like you."

The ambassador buried her head in her hands, shuddered, and, groping for a handhold on the edge of her desk, pulled herself back to her feet. The other two women stood apart as she found her way back to the cabinet, removed the bottle Cort had come to hate, and set it down on the desk. They watched as she set her chair upright again and collapsed into it, with a finality suggesting that all of her ability to support her own weight had fled, and would never again return to her. They let her squeeze four drops of the powerful euphoric into a glass, drink it, and enjoy a brief moment of exquisite pleasure before, too soon, it faded and left her in the same trap she'd inhabited before. They were prepared to stop her if she drank more, but she thought better of it, putting the bottle away before placing her hands palms down on the desktop. "All those things you said, Counselor... those are all things you *can* do. But they're not what you'd *prefer* to do. Are they?"

"No."

"I could tell. That letter was a draft. You haven't sent it, have you?"

Cort shook her head. "No."

"Then there has to be something you want. We can negotiate."

Cort stared down the ambassador, hating everything she stood for in this world, hating especially that she continued to draw breath. "What I *want*," she spat, "is the pleasure of ripping your throat out with my bare hands. But the legal repercussions would destroy me. I'll satisfy myself with what I can *have*."

"I can appreciate that," Pendrake said. "And that is?"

Cort said, "I can offer you two alternatives to prosecution."

"The less preferred of the two: Kearn and I leave this room for ten minutes. You kill yourself. You don't leave a note. You just find some way to die. You're an imaginative woman; you can come up with something... perhaps an overdose of that awful orange stuff, if an overdose is possible. You become one of those mysterious cases of sudden self-destruction that occur every once in a while, and are never explained to anybody's satisfaction. Kearn will see to it that her friends outside support the story. I won't raise any objections."

"This would, I admit, give no small degree of pleasure. The only difficulty I have with this option is that it still leaves us with the problem we started with—keeping this treatment out of human hands."

"The preferred option: survival. You decide you want to live, at any cost. You come with us and pay a discreet visit to the *Xe*, pleading guilty to charges that he will keep from the official records in exchange for your promise to submit to immediate treatment. You allow us to take you to the redeemer and you take the treatment. You come back here. You retain your position. You stay quiet. We watch you for a week or so, until we're certain the effects have become permanent. You go back to doing the same things you were doing anyway, living your life, pursuing what's left of your mediocre career without your dangerous capacity for acting on malice or ambition."

"But from now on, you operate with only one priority, under my explicit orders: finding some acceptable and discreet means of bringing our relationship with these people to an end. You send me regular reports on your progress. You take what satisfaction you can from the knowledge that you're doing some good for the human race. In a few years, with this place in your past, you retire wherever you would have chosen to go anyway, and live in peace. All that time, you live your life as a spectator, but at least you still get to live it. And you never hear from me again."

Cort's voice cracked as the anger and hurt overwhelmed her. "These options will only remain available for the next ten minutes. Otherwise, I start the legal machinery and let what happens, happen. Is that *goddamn* clear?"

Pendrake used a knuckle to wipe at the corner of her eye. "Yes. Thank you. It's understood."

"We'll let you get to it, then. Goodbye. Maybe we'll see you alive again. Maybe we won't."

Cort and Kearn left the room, shutting the door behind them, nodding at the two men standing guard but moving past them to the end of the corridor, where Andrea Cort released the breath she'd been hoarding and fell against the wall, chin trembling.

Marys Kearn hovered over her protectively, clearly half-expecting a further surrender to gravity, not relaxing it even after it became clear that Cort was steadier on her feet than she looked. Noting this, but not commenting on it, Cort had the distant, analytical thought: *this must be what having a friend is like*. She could not help rejecting the label itself as inappropriate, in her case—she had no room in her life for friendship—but was able to find some enlightenment in the principle: a datum she might be able to use, someday, in her work.

After a minute or two, in what appeared to be more an attempt to fill the silence than anything else, Kearn asked: "Were you actually serious about recommending me for transfer?"

Cort managed a breathless, "Yes."

"I'm honored. But I'm not certain I want it. Not if I have to think the way you do, all the time."

"If you do come to New London," Cort said, "I think you'll find that the majority of the counselors you'll meet are significantly more human than I am. I'm my own piece of work. But the decision's yours. I just want you to know that the offer's there."

"All right," said Kearn.

But there was something else, and as the minutes passed, Kearn made a number of false approaches, each time retreating from the issue just before trusting it to words. Cort didn't prompt her; she just let the process take its time, following the thought process with every sideways glance, every suppressed interjection, every moment when the decision was made, and then rejected. It was beautiful, she thought. That's what life for any sentient being should be: the constant consideration and selection of options.

Then, still circling the issue, Kearn said, "I think she's going to decide to live."

"Oh, I don't doubt that at all. A creature like that can't conceive of the world without her in it. She also can't conceive of a world where she isn't really in control, even if she's not supposed to be. She'll choose the Caith treatment believing that she's really putting one over on us, and imagine she's scratched

out a victory, up until the moment she has to live with it and finds out how little power she truly has.”

Another hesitation, and Kearn finally arrived at the terrible place she’d been avoiding. “I noticed: as angry as you got in there, you never once told her what it was like for you, what it was going to be like for her. You never even referred to it.”

At the other end of the corridor, Pendrake’s office door slid open.

“No,” said Andrea Cort, as she went to receive the ambassador’s decision. “I sure didn’t.”

Unlinkage

Eric Del Carlo | 8511 words

The first staggered Etta Pryor. Literally—she was crossing the kitchen, then felt the impactful sensation, located just below her right collarbone, and her footing lost all rhythm as she lurched across the gleaming floor tiles.

The second blow hit just above the heart, and that sent her careening into the chromed refrigerator. Her feet went out from under her as she yelped her surprise.

She was on hands and knees, and Bethany was watching her with goggled eyes from the table, when the third invisible strike caught her jaw and turned her head halfway around on her neck.

Bethany screamed a perfect four-year-old alto scream.

Etta panted her way toward speech, toward instinctive reassurance for her daughter. Bethany had been colorsplashing on her tablet at the table while Etta was about to get breakfast started. It was a lovely morning, in a series of lovely mornings.

“Mommy! Mommy!” Bethany found her words first. She bound out of her chair toward where her mother had fallen.

Etta tried to wave her back, like there really might be an invisible assailant loose in their posh kitchen. But Bethany was on her and stroking her mommy’s hair, a reflexive move to comfort her somehow, to do *something*. Amidst all the shock, Etta swelled with love and pride. Her little girl was just so perfect.

“It’s okay, sweetheart.” Etta pushed up into a kneeling position and took Bethany’s small hands in hers. “Mommy just fell.” A lie. And she’d also just referred to herself in the third person, a habit Bethany had lately pointed out was “sillybones.” Etta amended, “I tripped on something. I’m sorry I scared you.”

“Are you all right, Mommy?” Eyes still big, but no tears in them. She’d been frightened but wouldn’t let herself cry until she knew what had happened.

Etta didn’t know what to tell her. This was... impossible?

But the sensations, the impacts—she recognized them. She took a quick physical inventory. She touched her chest, her jaw. Already she knew there would be no swelling. The echoes of the blows still rang in her bones. Yet the hurt was a phantom hurt. She felt no real pain from the strikes. These had just been approximations of the impacts, to let her know they had occurred.

Right now she should be advising her Brute, passing strategy through the link, outthinking the enemy.

Etta shook herself and took her daughter into her arms. The blows had been ethereal, empty recordings of sensations, but she’d hit the refrigerator hard and dropped gracelessly to the tiles. Her shoulder throbbed, and she had banged her knee but good.

Bethany didn’t let loose with her tears, but she made snuffling sounds, and Etta held her and rocked her, and these contacts felt utterly right and true. She loved her child with absolute conviction. And Bethany loved her right back. All was paradisiacal.

Except that at age thirty-six Etta Pryor’s military career was over a decade behind her. She was no longer linked to her Brute. None of this should have happened here in her kitchen this morning.

Dr. Keita was a “not” doctor, and Etta liked that. It meant he led off assuaging her worst fears. It was not cancer, not a brain tumor, not Switcher’s.

Etta sagged with relief in the humming white room. Dr. Keita had made time for her. She could afford a doctor who did that. Just like she could afford her home and, of immeasurably greater importance, could afford to give Bethany a stable and pleasurable life.

She had handled her post-military finances brilliantly. Everyone had tried to write a memoir, but her war account had been the best, just the right mix of the personal and combat gamesmanship. The money had paid for the in vitro, and by now her capital had taken on self-perpetuating life. She would never know want again. Bethany would *never* have to know it.

But she still didn’t know what had happened this morning. And, it emerged, neither did Dr. Keita once his warmly related “nots” had run their course. Her financial stature couldn’t alter these circumstances. It was no one’s fault.

Still, she was the one who had to bring up the unmentionable subject.

Softly, barely above the efficient hum of the room’s diagnostic equipment, she asked, “Is it... my biomoss?”

Dr. Keita moved around on his stool, evidently unable to find any comfortable position. “I don’t have the instruments to make readings.” He kept a mellow tone, but Etta heard both shame and outright rage beneath the words. “Biomoss is *proprietary*”—he pronounced every syllable with crisp precision—“and the military won’t let us look.”

Etta knew this. While she had vividly described the particulars of linkage, her book gave away no clues about the nuts-and-bolts workings of biomoss. She explained that it worked, not how it worked. She had never been provided with those details. But as soldiers in the program, she and her fellows had learned a thing or two about biomoss.

“But...” The doctor made a humming sound of his own, musing and confused. “Your counterpart is dead. Correct?” It was a question he didn’t need to ask.

The biomoss in her head was linked to nothing. Its removal was an elaborate procedure, one with a tiny but appreciable fatality percentage. At best, the operation would lay her out for six months. That was half a year of Bethany’s life, half a year of Mommy being a limp semi-vegetable—if all went optimally.

Etta fidgeted inside her medical gown. She answered the question with an answer she didn’t need to give. “Yes. My Brute was killed.”

She was mostly okay with thinking back on the war, on her special slice of it. But just as often she remembered the good times, the camaraderie, as well as squirming across the jungle floor, keeping within range of her Brute.

The comradeship had been intense. They were a lone unit, culled from the ranks. Nobody could figure out the criteria, what traits got them picked. Maybe it was just their willingness to undergo the procedures. Reger had speculated about “invincibility syndrome” or wholesale self-destructive tendencies.

Still, the ones who volunteered to be the Brutes—Etta still couldn’t grasp how a person could do that. She wondered about it in her memoir, poetical passages questioning the nature of self and other easily digestible existential dilemmas. Some critics had called her the Thomas Kinkadee of war memoirists. The public gobbled up her words.

Reger, Hollen, Maalouf, Barber, Stills... Twenty-eight in all. Soldiers. Kids, it seemed now. Full of juice. Burning with war fever, or at least the primal urge to do *something*. Maybe if terror hadn't turned the whole world into a battlefield, Etta and her fellows, in an alternate timeline, might have become criminals. Or terrorists themselves. This was not something she had pondered in her book.

She had accepted the offer to enter the program, and they'd pulled her out of Brighton and told her what they were going to do to her. The insertion procedure was apparently vastly more simple than extraction, practically outpatient. The group was to train in Florida, or what unsubmerged remainder of the state people had no choice but to call Florida. These were some of the good times she let herself recall. There had been a certain frat house wildness to their training. They quartered together. Drills consisted of weapons training—nonsmart weaponry. Etta described her first time handling such an instrument as “like putting a musket's butt to one's shoulder, physically squeezing a trigger, and dreading the explosion and randomly vectored shot.”

Otherwise, there wasn't much discipline within the program. The officers seemed more like observers.

Fourteen of the group had undergone biomoss insertion. The other fourteen were still receiving treatments of a wholly different order. The vats were on the base, and half the group went to them about every third day. And every time they came back bigger. Bulkier. Roped with more muscle. It soon surpassed anything Etta had ever seen, bodies of such mass and strength they were grotesque... and beautiful. These were Conans, Hulks, Hydes.

But eventually they settled on a term: Brutes.

Another thing about the Brutes—they got less mentally sophisticated each time. That was the aspect Etta always had the hardest time grasping. Those fourteen were told their faculties would be impaired, but they had volunteered anyway.

As the vat treatments continued, the biomoss started to function. The links began, just as their half of the group had been told would happen.

Etta had illustrated that process in her book. Her biomoss—that mysterious gooey bioweapon-level substance—had somehow been directed to fix upon a particular Brute. Each of the handlers had a pre-selected partner. Hers was, or had been, a man named Conroy. She had interacted with him, talked at length in their barracks. They shared backgrounds and war stories and fraternized in the casual atmosphere. But those conversations ebbed and then stopped altogether after about six visits to the vat. Conroy's body swelled, and his mind shrank. He had difficulty forming complete sentences. His expression became dull, his responses simplistic, then simpleminded.

Etta's fellow insertees never received official advisement as to the biomoss' origins. But the medtechs weren't uniformly close-lipped, and it became a midnight-around-the-campfire ritual among the soldiers to share what scraps of information they'd gleaned.

The smart money, their modest gestalt eventually decided, was on permaculture. Specifically, plant guilds. More specifically—and about as far as they could conjecture before it all collapsed into layman guesswork—nanomechanical oscillations. That was: seeds talking to each other.

There was a sense among the group that they were operating outside military ethics. Young Etta Pryor had thought the whole thing vaguely unreal.

Buck Reger emerged as the resident philosopher/cynic. He called them all

experiments in a mad scientist's lab, experiments who *knew* they were experiments, ones who'd entered into the exercise willingly. He was handsome, smirking, intelligent, the kind of guy Etta had slept with in college; and with the roughhouse ambiance on the base, Etta followed that same pattern. She hopped into bed with Reger, and no officer tried to stop her. Like most of her college lovers, Reger was selfish. And as with past bedmates, Etta didn't go back for a third time. Buck Reger met her refusals with a vast indifference.

It was Reger, however, who made a major deduction. Between weapons drills, the nonBrutes played a lot of basketball. It got competitive. Everybody played six moves ahead. Reger halted one afternoon mid-court, the orange ball balanced on ten fingers. He looked around and offered one of his self-satisfied smiles.

"We're all exceptional strategists," he said. Etta saw right away that he was correct. All fourteen with the biomoss insertions thought quickly and clearly. They had also already proven themselves in combat situations.

They could do the thinking, as their Brutes could not. By now Etta was receiving sense-impressions from Conroy. All of them were linked to their respective counterparts. The base's officers interviewed the handlers, asked them how it felt.

"They've never done this before," Reger said. He grinned at this further deduction. "We're the first."

The Brutes by now were gargantuan. They too finally ran drills, strength tests. Etta watched the man who'd been Conroy pick up the front end of a truck. She felt it too, in that strange remote way, feeling without feeling. The next day she was told to direct the Brute's actions. It was like mental experiments you did as a kid, seeing if any of your friends had ESP or could light a candle just by thinking it. Etta stared at the great mound of warrior muscle that was Conroy, screwed up her face in concentration, and *thought* the orders she'd been given at him.

Immediately, he went into the exercise routine. Etta watched amazed, also following his movements through the link. He obeyed each step. It was incredible. The linkage was strongest when he was physically active.

Theo Hollen was another of the handlers. After all fourteen of them had put their Brutes successfully through their paces, he approached Etta. He seemed the shiest of the group, a lanky unpretentious male. Etta, for no good reason, had thought he was gay.

"We will be sent into combat," he said to her privately in the barracks one night. He didn't make announcements the way Reger did. "All of us linked, armed with nonsmart weapons. We will be going somewhere where tech is useless."

"Useless?" Etta was half undressed. Hollen sat on the foot of her bunk.

He had soft gray eyes, the lashes long. He blinked at the wall beside her head. If he was good-looking, he had no idea he was, and selfconfidence was what Etta had always keyed on. So Theo Hollen was something of a blank to her.

"Yes," he said with some urgency. "Our biomoss is organic. We know that much about it. The Brutes are merely enhanced humans. We've trained with purely mechanical weapons, no chips, no correcting tech."

Etta thought it a neat bit of analysis, though she didn't know why he'd come to her with it. The group speculated constantly about the purpose of the program. The officers answered no questions.

She was about to say something when Hollen looked directly at her and blurted, "Can I get into bed with you?"

It actually wasn't far off the beam from sexual negotiations on the base. Things were frank and playful. But Hollen at that moment had an intensity about him that gave Etta pause. And that hesitation apparently was enough to deflate his courage. He muttered something about just joking and slunk off to his bunk.

Summer camp behavior was disturbing in an adult. Worse in a soldier. But Theo Hollen's prediction about where they were going had turned out to be absolutely accurate.

If Bethany wasn't sensing that her mother was worried, Etta feared her daughter would sense that she was worried about making her child worried. It was one of those Möbius strips of motherhood—a fear you couldn't get on the other side of.

Then again, Etta had never had to face something like this since Bethany had been born. Of course, she'd had no reason to ever expect her biomoss to reactivate, if that was what was happening, even though it *couldn't* be happening. But Etta had so carefully arranged her life, made her world meticulously secure for her daughter's well-planned arrival. Etta had survived a problematic childhood populated with deficient parents. She had every confidence she could do better on her own. And these first four years of Bethany's glorious life had proven her right.

She told herself the car would smart itself out of any trouble if something happened to her behind the wheel. She'd promised Bethany this outing. Weather forecasting had in Etta's lifetime become an oracular science, but a day of local safezone climate had been predicted. Etta had promised her darling daughter the river, and by gum she was going to have it.

They sang on the way. Between pop tunes and cornball folk songs, Bethany asked precocious mind-bending questions about random subjects.

"Where does light go when it's turned off?"

"How heavy is purple?"

"If I was a mermaid, would you still love me, Mommy?"

They were lovable questions. Etta did her best to answer and turned her answers into jokes when appropriate. She erred on the side of honesty with her child, aware that the lies piled up on her in her own girlhood had led, not indirectly, to her hell-raising teen years, and those years into military service. She didn't regret her military career, nor her participation in the handler/Brute program. But she wanted Bethany equipped to face every major decision of her life on her own terms.

The park along the river was full of other families. That was how Etta thought of Bethany and herself: as a *family*. No caveats, no disclaimers.

They spread a blanket and unloaded food, and Bethany went tearing across the grass. The sky was an almost unnerving blue, and there was birdsong and a gentle breeze. The river gurgled. Children frolicked, and Bethany fell in with temporary confederates who might as well have been lifelong friends. Etta sipped tea and nibbled a sandwich and watched her daughter. She chatted with other grownups enjoying the anomalous, beautiful day. She had an ease with people that somehow had never translated into a close circle of friends.

And the whole time she feared that phantom contact. They had been blows,

physical strikes to the body. If her long dormant biomass was indeed active, then whatever it was reading had suffered those hits. But her 'moss could link to one thing and one thing only: her Brute. Yet that linkage had ended with Conroy's life over ten years ago.

The day of riparian splendor came to an end, and Etta drove her sated and exhausted daughter home. They lived on a gentrified street. The tension had eased in Etta somewhat. Dr. Keita yesterday had suggested, without actually suggesting it, that PTSD might account for her episode. Long-delayed combat stress. Etta could think of a thousand reasons why this would not be. But she did not—could not—rule out the possibility.

She pulled into the drive, unbuckled the sleeping Bethany, and lifted her out of the car.

Which was when she was struck in the stomach, a dead-on full-strength gut shot. No hurt accompanied the blow, but the painless translation was startling and traumatic enough that she doubled halfway over. Bethany slipped alarmingly in her arms and woke with a gasp. Etta backpedaled two fast unsure steps, then fell.

She landed on her pert backside, putting all her effort into keeping any part of her child from colliding with the ground. As she sat on the cement, winded and frightened, she was struck again, in the ribs just below her left breast. Despite herself, she flinched. Bethany, big-eyed, was almost nose to nose with her.

"Mommy, why did you fall again?" There was still some sleepiness in her voice, but Etta heard the deep disquiet beneath.

Two more invisible blows landed, but she didn't wince at either one. She worked a knee, then a foot underneath herself and stood, holding her daughter tenaciously in her arms.

"I'm just a little clumsy lately, sweetheart." Maybe that wasn't untrue. Maybe her clumsiness was simply mental. Post-traumatic stress disorder, finally come a-calling.

She carried Bethany into the house.

"Etta?" said the male voice, because nobody answered "hello" anymore.

In another century, she could have hung up. But by setting her personal netter to search and contact Theo Hollen, she had revealed her identity and committed to this action. Still, it felt like she was calling someone from grade school who'd had a terrible unreciprocated crush on her. Actually, that wasn't too far from the truth.

"Theo, I know it's been a long time..." she began since there was absolutely no other way to begin.

"I feel like it hasn't been that long. Every time I read your book, it's like I'm interacting with you."

Every time? Why did that sound creepy to her? But the social niceties beckoned. "How are you, Theo?"

He had an answer for her, a long one. The facts were simple: never married; became a financial advisor. Etta let him go on until he started to double back over the past decade.

"I have a problem, Theo." She couldn't have gone to anyone else from the program who had survived. In her memoir she hadn't named her fellows, using clever monikers instead, but several former handlers had tried to sue her

anyway, once her book started raking in the money and making redundant everyone else's war accounts.

She was surprised at her own gall in contacting Theo. Her name for him in the book was Howdy Dowdy.

"How can I help, Etta?" he asked as eagerly as she'd expected him to.

She hesitated one last time, then unloaded. It was mortifying, but the mortification had an element of comfort to it. She was revealing this bizarre, embarrassing thing, but revealing it to someone who could at least understand the basics. Biomoss, so far as anyone knew, had never been used again once the terror heads and the blankzone were destroyed.

But when she finished her account of the two incidents, it was Theo's turn to pause, and that silence made her cringe. Perhaps she had made a serious error getting in touch with him.

In a subdued tone, he finally said, "I dream about Farmer sometimes. In the dreams he's still a Brute, but he can speak. It's ordinary domestic scenes. Eating breakfast together, walking the dogs."

Etta swallowed. "What does he say?" Her voice trembled slightly.

"He talks about how successful our mission was into the blankzone. And he wants to go on another one. He's trying to convince me to come along."

Etta had made an audio-only contact, but in that moment she wondered what Theo Hollen looked like. Others from their unit had crashed and burned, both financially and mentally. She'd seen Ching interviewed last year. She had contracted Switcher's Disease and was a frail, doddering old woman at thirty-five. Theo was dreaming of Farmer, his dead Brute. Farmer had died just like she'd been told Conroy had, but Etta didn't dream about Conroy.

"Theo... I think Conroy is still alive." This was more than mortifying. This was a delicate momentous admission. Here she revealed her state of mind. But she had been driven to this conclusion. She still felt herself falling, felt Bethany slipping from her arms. Imagination cracked her daughter's skull on the concrete of the drive.

Theo said, "All the Brutes are dead."

"So we were told. I had two bullets in me. The shock had me delirious. I didn't know the mission was over until I was carried out on a litter."

"But..." Theo had a tremble of his own now. He took a breath, and it disappeared from his voice. "You felt the linkage break. You say so in your book. That could only happen if Conroy died."

She had written that. She'd *had* to. It was the memoir's denouement. Her editor had told her that moment needed to be in there. And it wasn't a lie, not quite. After she had been wounded, bleeding on the jungle floor, she had felt a wrenching, a disconnection. When the other surviving handlers described the same sensation, she understood what had happened. But some part of her always wondered if she had simply settled on the interpretation, finding it convenient, needing that finalization. Certainly it had boosted the quality of her book.

"I believe my Brute is still alive," she said, and saying it made her stubborn, confident or crazy.

Theo didn't hesitate this time. "Then we better try to find him."

Etta Pryor felt relief, then: "Sorry. *We*?"

Now she knew what Theo Hollen looked like these days. He was a bit

chunkier, with wiry gray in his spiky hair. He moved slower but still as if he were nervously negotiating his way through a crowded room. His socially awkward tics were all intact.

Etta had been unable to stop him from coming. It was a ridiculous distance to travel, and she had no right calling in such a favor from him. All he had said was, "Nonsense. Nonsense."

Perhaps he had been hoping all these years for some way back into her life. Despite her unease, Etta brought him to her house. He complimented her at every turn. She looked beautiful. Her home was elegant. The cup of coffee she made for him was amazing.

But when they sat together in the kitchen, and she described in detail the two incidents, Theo's unremarkable features lost their goofy cast. His face hardened. His long-lashed gray eyes glinted with militarily acute concentration.

Once again she experienced a sense of unburdening. Theo didn't coo and coax her. He just listened and made notes on his handheld netter.

When she'd finished, he took a long swallow of coffee, set aside the imported mug, and opened a map. It popped up from his device and hovered over the table. Etta saw with a start that it was her street and her neighborhood. A portion of the map changed color.

"That's the radius," Theo said. "Beyond that we couldn't read our Brutes." The map suddenly animated, traffic moving on the holographic streets, public access data pouring from every structure. "This is the time of your first event. And this"—the scene's details shifted—"is the second. Conroy was within this area at those times. We just need to find out where he was and what he was doing."

Etta couldn't help the gratitude she felt. Someone believed her. Yet she couldn't completely shake the disquiet. Theo's job as a financial advisor made him a productive member of society. He didn't act like a stalker or an obsessive. But maybe his relative normality was a cover, a shuck. Maybe he was "believing" her for his own ends.

She hated her distrust. Not one other person from the old program would have made this effort for her.

They studied his map awhile, discussing the possibilities. The afternoon was waning. Bethany was away on an extended playdate. It was amusing that she had more friends than Etta did. Or it should have been amusing.

Eventually Etta rubbed her eyes and leaned back in her chair. She hadn't even taken Theo into her expansive living room, consigning him to the kitchen, like he was the help.

"Etta, there's something you need to do."

In a suddenly cautious voice, she asked, "What's that?"

"Try to read Conroy. See if he's within the radius right now."

It was something she should have done already, before even contacting Theo. She knew this, yet had hidden it from herself.

"Of course..." she murmured. She closed her eyes and reached out. On a deep level, she listened for those supposed nanomechanical oscillations, like a seed conspiring with a friendly neighbor plant to produce weedkilling volatiles. The linkage was empty. She felt she had just tried to exercise an atrophied muscle. She opened her eyes. "Nothing."

He nodded, features still a hard mask.

She had a sip of cold coffee. "You ever hear from any of the others?"

That snapped him out of his fugue of concentration. He blinked long lashes at her. "Not for a long time. At first I tried to stay in touch, but after a few pretty nasty rebuffs I learned my lesson. Unless someone from the unit contacts me first, I just leave it alone."

Etta nodded. "Can I ask you something more personal?"

"Yes." He squirmed slightly on the other side of the table with a puppy dog eagerness.

She asked, "Did you have your biomoss removed?"

"I did. Farmer was shot forty-one times. Or at least he lived through the first forty-one shots. I felt every one, in the way we always felt things. Remotely. Ghost sensations. After the war I kept thinking about those last inputs and how my 'moss might still have them stored up somehow. I was very close to Farmer in a way. I didn't want to experience his death again. So I underwent the extraction procedure. I'm glad I did it."

Etta nodded again.

They made plans for tomorrow, then Theo went off to his hotel.

It wasn't a matter for the police, obviously, so this investigating had an amateur sleuth vibe to it. The streets nearby Etta's home had been gentrified in recent years, which suggested that the neighborhood hadn't always been this well off. It hadn't. Parts were still somewhat sketchy. Some of those stretches lay within the biomoss' readable field.

She and Theo split up. Today she had arranged for a daycarer, one Bethany liked a lot, to come to the house.

A row of partially abandoned commercial buildings looked promising, but they would be the hardest to gain access to. She and Theo would investigate them together toward the end of the day. She went about her inquiries dutifully. She would have thought that not having Bethany around would leave her less leery of another barrage of phantom impacts, but she was still anxious. What was Conroy doing? Who was striking him those blows?

But such questions were set dressings. They barely hid the real drama of the piece. The bigger questions were: How could Conroy still be alive? And: If he really was dead, then what the hell was happening to her?

Etta continued to insist to herself that she wasn't crazy or traumatized. She remembered the mission into the blankzone and everything that had led up to it. The officers at the secret Florida base briefed the unit a week before it deployed. For that week they were on standby. Their nonsmart weapons training was complete. The handlers were all able to manipulate their Brutes. Now came the operational details.

The blankzones had been popping up for months, though none but the highest military levels knew about them. These were pinprick areas of full tech blackout. Intelligence determined that phased array optics had aggressively effected this phenomenon.

Satellites, always on the watch for the newest terror sector, couldn't penetrate. Micro-chaff, launched repeatedly above the zone by nonsmart mortars, was apparently responsible for that undetectability. The PAO camouflage was projected upward against this airborne screen.

But the absence of any—*any*—*technological* signature was its own red flag. That effect had evidently been coupled with a sophisticated, localized EMP event.

Lately, the blankzones were occurring in South America. And they were growing larger. Most recently, a town had winked out. No one died, but nothing with a chip would function. Nothing smart worked. It was, simply, a crippling. Its implication was clear and ominous. Once an area was blanked of tech, the perpetrators could do as they liked within it, undetected.

Or the scope might be far broader for this new combined terror weapon. Blank the world back into the Stone Age, or what would certainly feel like it to most populations. Thus, the preemptive attack: soldiers inserted with purely organic biomoss and armed with clickety-clack guns, and the creation of monstrosly strong but correspondingly witless Brutes.

Satellites found a fresh area of unnatural quietude on the busy globe. Again it was in South America, in jungly reaches. Twenty-eight soldiers were dropped and left to slog through the wilderness. Etta remembered her disbelief, her horror, that generations of military personnel had fought wars this way, without a smart anything to guide or advise or warn.

They advanced like warriors through the bush, the largest number they could deploy without giving themselves away.

Reconnoitering and raiding the camp were the next phase. The Brutes went in, with the handlers laying down cover fire. Once the fireworks started, it was a battle like any other. Mayhem and death. The enemy was armed with nonsmart weaponry as well. But they also had to face the formidable, purely physical juggernauts that came pounding out of the jungle—nightmarish humanoid beasts who crushed bodies and skulls with bare hands.

Etta had directed Conroy. In combat, the link was intense. The Brutes were systemically dismantling the encampment. It was going beautifully. Then Etta had been surprised by a gunman who'd slipped through the tightening line and plugged her with two bullets, in the thigh and her right side. After that she was down. The casualties mounted as she writhed senseless on the ground. Soldiers and terrorists died, as had been happening for many years now.

At some point, she felt the linkage break.

The mission succeeded, at a high acceptable cost. The phased array optics gear was either captured or destroyed. During the debriefing Etta never learned one way or the other. Of equal importance was the wholesale slaughter of the terror network heads who had evidently gathered in the blankzone. They must have thought their strategy granted invincibility. The long-standing Whac-A-Mole theory of terrorism—that if you killed one or ten, that same number would be immediately replaced and nothing real would be accomplished—at last came apart. Apparently Etta's unorthodox unit had killed the most important minds behind the worldwide terror campaigns. Activities fell off considerably. Hostilities regressed to quaint 9/11-era levels.

Details of the operation were eventually declassified by the military. These amounted to bragging rights. The move allowed Etta to write her memoir.

Today's mission was far easier. Etta worked the streets, asking innocuous questions of store clerks and bartenders. She was looking for a lost dog, she said. She'd seen a strange big man in the area the past two days. She even named the times of day. She was afraid he had abducted her dog. Had anyone seen him?

Nothing came of her queries, but she still felt she was accomplishing something. At least she was being active, not passive. She'd had things very good for a long while. Now she had to fight for what she'd gained. Fight for Bethany.

Evening came on, and she met Theo at a cafe at the prearranged time. He hadn't contacted her during the past few hours, which meant his canvassing had been as fruitless as hers.

He confirmed this conclusion with, "Well, no Brute-sized sightings in the neighborhood. So far."

Etta tried not to let herself get demoralized. She was hungry enough for a snack. Theo ordered a milkshake, explaining his weight gain. Still, Etta thought as she took a moment to really assess him, he had aged well. He looked healthy. Maybe he even had a few helpful character lines on his face now.

"Hey," he said suddenly, "I thought of something. You asked if I ever heard from others from our program. Like I said, I have from time to time. But the last one was Buck Reger."

"Reger?" Etta said the name a little too sharply. In her book, Buck Reger was rechristened Zorro, a fighter with a dandy's conceit and wit. She had also made mention of her suspicion that Howdy Dowdy, Theo's nom de plume, was jealous of the two times she and Zorro had gone to bed together.

Abruptly, her face was hot with an embarrassed blush.

Theo either didn't notice or didn't call attention to her reaction to spare her further embarrassment. Conversationally he said, "Yes. Less than a year ago. He wanted financial advice. Said he had, or was going to soon have, a sizable amount of capital. He sounded off, though. Like he was trying to convince himself of something."

Etta had abandoned her lemon muffin halfway through. "What do you think it meant?"

"That he was doing drugs. Or booze had gotten to him. When people who sound unstable talk about large sums of money, it's usually delusional to one degree or other." Theo said this matter-of-factly. "I didn't hear from him again."

It was time to hit the row of semi-derelict commercial buildings. Etta paused to call Bethany. Her daughter looked grave on the netter's screen. "You didn't fall again, did you, Mommy?"

Etta grinned because she could tell her child the truth for a change. "No, honey. I didn't. I'll see you soon. I love you."

"I love you, too."

Anything more she said would probably only distress Bethany. *I love you, too* was the natural end of conversations between them.

She and Theo set out into gathering night.

It started to feel seriously hopeless when they met with their third welded shut industrial door. These structures had been warehouses or cheap manufactories, and now they were just eyesores, destined for inevitable demolition as the city continued to gentrify.

"Goddamnit," Etta muttered.

"Keep up," Theo said, footsteps crunching away toward the next building. He wasn't being the forlorn puppy. For whatever reason he was taking this task, and thereby her, quite seriously.

Etta silently castigated herself. She felt she had somehow manipulated him. He had flown practically across the continent to be here, and she had nothing to offer him but her bizarre predicament and the questionable belief that Conroy was still alive.

Then again, she had never seen her Brute's dead body. The mop-up team

had arrived after the blankzone's field was disabled and had flown her straight out.

Etta's foot slid in the grit of the weedy lots fronting the buildings. She let out a gasp. Theo turned around sharply.

"Is it happening?" he asked. "Do you feel the blows?"

She shook her head. Unease bloomed in her. "But I think I feel... him." It was true. She *thought* so. The old remote mental pathways seemed now to twang with life. The oscillations might be back on line.

"How near is he?" Theo demanded. "Let's have a direction, soldier." There was no mockery in his tone.

She pointed ahead. A blunt structure bulked against the night. Other people milled in the area, murmuring, shuffling. Homeless folks maybe. Etta was accustomed to a general sense of security. Recent events notwithstanding, that feeling of safety had prevailed for years. It had allowed her to bring Bethany into this world. But this underlit street in this shabby part of town undermined that security.

Theo moved quickly, and she kept pace this time. The building's lowest windows were barred and dark, but there was light from an upper story. Shambling shapes moved down one side of the structure. Etta paused at the mouth of the alley, but only to let her eyes adjust to the deeper dimness. She had the sense that Theo was picking out potential targets. He didn't take her hand, but they moved in lockstep along the narrow piss-smelling way.

Halfway down there was an open door.

The light that shone out into the alleyway wasn't inviting. Neither was the atmosphere when Theo and Etta entered without hesitation. It was a close, rancid air. They climbed steps. Someone lay snoring on one of the landings. Above, Etta heard the sounds of a crowd. More, she felt a strengthening of the link. It pulled tight in her, like a string being wound on a violin.

They went through another door at the top of the stairwell, into a wash of revelry and ferocity. Etta saw instantly what was going on here. A fighting ring stood in the center of the wide warehouse space. Spectators had assembled. The blood sport was underway.

Theo caught her arm as she started toward the roped off fighting area. "Easy," he said by her ear. "I don't see a Brute. Do you?"

Two figures were exchanging gymnastic blows in the ring. Both rippled with muscle, but they were puny creatures compared to the augmented grotesqueries Etta and Theo had known during the war, for that one famous operation.

"No," she said. "But Conroy's here! I have to—"

"And we're overdressed for the occasion. Let's hang back and recon, okay?"

She saw that they didn't fit in, even wearing casual clothing. The crowd was rough. This was no official sporting event. The onlookers howled and shouted and threw sympathetic punches at the air. There was no seating. Paper money was changing hands rapidly. Whoever was staging this had to be getting a piece of that, Etta figured. Theo steered her behind the jostling throng. A few looks, suspicious and indifferent, were thrown back at them, but no one made a move their way.

The fight was brutal. When it was done, one man was down and had to be carried off. Blood spattered a stone floor.

A moment later Etta's throat closed. An enormous figure was being led out

onto the floor. The crowd erupted with savage cheers.

"There's Conroy." She barely heard herself say it.

"Yes. And there's Reger."

Theo's words startled her, but she peered through the mass of bobbing heads and saw Buck Reger walking with Conroy toward the improvised ring. Even at a distance she recognized him, a confidence in his stride.

Why was *he* here? Why—

The crowd's roar only mounted, becoming deafening. Another combatant was approaching the fighting area from another direction. He was tremendously muscular, surely enhanced, but Conroy was still half again his size. The spectators were in a frenzy by the time the two fighters entered the ring. Undoubtedly this was the main bout, the reason all these ne'er-do-wells had come here tonight.

She turned to Theo but found him speaking into his netter, of all things. She couldn't hear a word he said. Their investigation had succeeded. She was still stunned by the sight of Conroy and Reger. She needed to find out what the hell was going on here.

Etta started forward through the bodies as the fight was set to commence. The crowd surged, and she felt its collective ferocious strength. But it was Conroy who took her attention. The linkage was suddenly strong, a thrumming connectivity. It had been this way in training during intensely physical exercises—more so in combat when they had gone into the blankzone.

A bell indicated the start of the bout, though it might have just been two pieces of metal clanged together. Certainly there was no ref in the ring with the two competitors. Etta steeled herself for a blow, even as she struggled to move forward, but Conroy landed the first punch. The other contestant rolled with the glancing shot, spun back up from the floor with a crazed grin on his face, and chopped twice across Conroy's massive chest.

Spectral echoes of those blows reverberated through Etta. But she didn't stumble this time. Someone in the crowd elbowed her hard, and she shoved back roughly, ready to call on old combat skills if necessary.

Suddenly Theo was at her side, helping her cut a way toward the ringside. His gray eyes glinted once again with determination.

She got a nearer look at Conroy. She had never before seen someone alive who she had presumed was dead. It was a surreal experience. Her Brute even *looked* like something reanimated. His face—attractive before his visits to the enhancing vats, Etta remembered—was a cruel topography of corrugations and scars. He was still a mountain of a man, but now Etta could see the slackness of some of his muscle groups. He didn't move well either. He lumbered about the ring. His roundhouse punches didn't connect, but Etta felt every strike he received. There were no rules here. Conroy's opponent inflicted harm any way he liked.

"This is close enough!" Theo was shouting in her ear now. Again, he took her arm.

He was right, Etta realized. Was she going to intervene here? This crowd would never let her interrupt the fight. At least she could get a closer look at Reger.

Conroy's appearance shocked her. But Reger, standing outside the ring only twenty strides away, truly looked like warmed over death. His features were gaunt and parchmentlike. His eyes seemed like soulless hollows. He maintained

a careful posture, but the poise, she felt sure now, was all bluff. Theo had probably been right in his assessment. Something, dope or booze, had eaten Reger alive.

The survivors of the handler program had all done different things after the military. Buck Reger evidently had become an underground fight promoter, making some kind of miserable living off his freakshow charge.

Etta glared unseen at Reger's ghastly smirking face as she withstood her Brute's injuries. This was how she had monitored Conroy's condition during combat. Then she turned both her gaze and focus on the ring.

It was an unbalanced contest, one surprisingly that didn't favor Conroy. Once, this warrior had been formidable, nearly unstoppable. Now he was a foundering hulk. No glimmer of intelligence showed on his battered face, just dumb animal awareness and resignation. He threw his useless punches by rote. His limber adversary let a blow land occasionally, just to keep the crowd in it.

Etta, jaw setting and teeth tightening, reached through the link. She remembered how Conroy had moved, how his center of gravity and mass could be used to fluid, deadly effect. He might be a heap of meat, but he could move with balletic grace and speed, when properly directed.

His jacked-up, grinning antagonist went at Conroy without a plan of any depth. After a moment of study, his patterns were obvious. Etta told Conroy where to stand, told him to wait, and told him to let go with a hammer fist at the right second. Conroy did as instructed. Etta fancied she heard the meaty smack of the blow over the tumult. Conroy's foe dropped to his knees, a look of incredulity on his face.

Etta didn't have her Brute kill the bastard, since the man probably wasn't looking to murder Conroy. But she sent a command through the link, and Conroy pounded a brick-sized fist across the fighter's jaw, one blow, breaking bone but not killing.

The arena went wild.

Again, the crowd surged. Etta didn't feel drained after using the linkage; rather, exhilarated. The throng was going mad, screaming and cheering. The second fighter was rolling on the bloodied ground, helpless. Conroy gazed into the middle distance.

"We need to get somewhere safe!" Theo yelled. This time he did take her hand. Etta was surprised when he hauled her forward, ducking through the ropes, into the ring itself. Behind, she heard what might have been an added commotion, something beyond the frenzied fight crowd noises.

As she and Theo rushed into the open area, Reger turned. Those burned-out eyes widened. She stared at him. Zorro had long since lost his panache. He had all the flair of a wino now.

Conroy looked her way as well, and, for just an instant, Etta saw something she would willingly mistake for a smile flicker across his abused face.

Then the police raided the place.

It actually wasn't the cops, but military personnel. Theo Hollen still had contacts with command, and he had used them, and a platoon had shown up and taken Conroy and Reger away and left everybody else scrambling for the exits.

Etta and Theo followed to the hospital where a lieutenant had told them Conroy was to be treated before eventually being transferred to a military base.

She could have gotten to the hospital on her own. The intensity of the link had dwindled once the combat situation ended, but she could still feel the phantom sensations.

She talked at length to a doctor, with the same lieutenant present. Then she spoke to the officer, then went to find Theo.

She found him in mid-conversation, pacing a waiting area, addressing his netter in increasingly exasperated tones. She paused at an entryway, close enough to hear, "... I'm sure you love me. And I enjoy our time together. But I'm helping out a friend." He turned, saw Etta, and rolled his eyes theatrically. "No. Sorry, Denise. I've got to go." He pocketed the device.

Etta said, "I didn't mean to interrupt. Or eavesdrop."

Theo waved, the gesture both aggravated and amused. "Hell, I seem to have this same conversation every four months."

"With the same woman?"

He stopped pacing abruptly. "Hardly. Every time one gets pushy, another comes along. I like the variety, but it has its downside." He regarded her with a wry smile. "Howdy Dowdy's not too bad with the ladies, it turns out."

He laughed, so she laughed with him, and felt mortified once again. But Theo came over and punched her arm, and it all felt okay after that.

She told him what she had learned.

Buck Reger was a hardcore kick addict. He was confessing almost faster than anyone could listen.

"He'd planned this well before the blankzone operation," she said to Theo. "He was a true cynic. He saw the commercial potential of a privately owned Brute. He'd also come into a little money, enough for bribes. He learned that the biomoss link could be severed, or at least temporarily disabled. He planned to smuggle his own Brute off whatever field of battle our unit ultimately deployed to. Reger had deduced it like you had, Theo. He figured we were going into a tech-free sector, which would make the abduction that much easier. He'd bribed the mop-up crew. But his Brute died in combat. However, he was ready for that contingency. He took someone else's. He took mine. He incapacitated the link with a chemical overdose and had Conroy trafficked out of there."

Theo gaped. "Jesus. The balls on that guy!"

Etta shrugged. "Reger planned on being rich. Maybe he even kept Conroy on ice awhile. I'll bet the Brute would just sit in a shed and eat porridge for years if someone told him to. Maybe Reger even started to make some money on the black market fight circuit. That's probably when he contacted you. He had to already be on the kick by then."

"That stuff's bad news." Theo shook his head. "I had a girlfriend who got into it a couple of years ago."

Etta felt a twinge as she tried to work with her reassessed impression of Theo Hollen. He wasn't after her romantically at all.

"How is Conroy?" he asked.

"He's been through a lot, over a long period. But he's tough. He'll be okay."

Theo said quietly, "I'm glad... one of them survived." No doubt he was thinking of Farmer, his own dead Brute.

At that moment, an excited voice cut across the waiting area. "Mommy! Mommy!" People looked up and smiled as Bethany came dashing toward Etta. The daycarer followed.

Etta lifted her daughter, kissed her. She looked to the daycarer and said,

"Thank you for staying on the extra hours."

His nod was more of a bow. "I can keep her later...."

But Etta had wanted to see Bethany. The day had been too long, the absence from her child too troubling. With Bethany in her arms, she said to Theo, "Hey, I need to introduce you two."

Bethany was selective. She didn't treat every new grown-up like a friend and was the same way with other children. But she warmed to Theo. In fact, there seemed to be no warming period at all. Bethany was standing next to Theo holding his hand almost before Etta knew it.

Finally, she said, "I was told I could go in and see Conroy. Bethany, you want to come with Mommy?"

"Mommy's calling herself Mommy again." Bethany said it to Theo, looking up at him with a knowing smirk. She was still holding his hand.

"Why don't you go see him alone?" Theo said. He gave Bethany a conspiratorial wink. "I'll tell this charming young lady all about the ins and outs of financial advisory."

Bethany acted unduly excited about the prospect. Etta left her daughter in the former fellow soldier's care and got into the elevator to go down one level to where Conroy was being treated for his injuries, some of them rather old.

The lieutenant had been unusually forthcoming to her earlier. He had told her the military had learned a few facts about biomoss in the intervening years, including its tendency to slowly decay. It was why her linkage to Conroy had at first been spotty. But it was unlikely the organic goo would ever break down entirely.

Buck Reger, in the midst of his runaway drug-withdrawal confession, hadn't yet said whether or not he'd known Etta lived in the area of the city where he had set up the illegal bout. Maybe he'd been trying to get to her personally, maybe not. Maybe he harbored addled feelings for her. Maybe not.

Before Etta stepped off the elevator one floor down, she had finally and irreversibly made her decision to have her biomoss extracted. It was too much of an unknown to still have inside her. The procedure would be costly, yes, in terms of time. Six months. But she would start to prepare Bethany for it now, and commence with the operation in, say, two or three months. Bethany could sleep in the same room with her during her recovery. Etta could afford that luxury.

Perhaps she would even have a friend around, now and then, someone besides a hired caregiver. Theo had told that woman Denise on his netter that he was helping out a friend, implying that that act was important. Important enough, seemingly, to jeopardize a romantic relationship.

But right now somebody might need *her* as a friend. She meant to unlink herself finally from her Brute. But that Brute was still in some damaged sense a man named Conroy. He was also a war hero.

Etta Pryor knocked once, then entered his hospital room.

Drummer

Thomas R. Dulski | 14419 words

I knew a lot of the other drummers on the Great Circle route in those days. There was a kind of wary kinship among us, derived, I guess, just from the sight of a familiar face amid the endless tide of strangers. But it was more than that, too. There was some common thread that ran through us all. We were all old and tired, regardless of our chronological age—world-dirty before our time. We carried the black cold of space like a chill in our bones. And we slept in the restless, dust-swept dreams of a thousand planet-falls.

The drummers—we were the first true spacemen, but no history will remember us. No, they'll read about the colonists, the early generation-ships, the habitat-dwellers—all those millions who made their one move and then dug in for the duration. But in my day most of that expansion was over. The stars were peopled with groundlings: third, fourth, even fifth generation colonists who got all misty-eyed over great granddaddy and the Great Trek. Most of them had never been in space. But we were the ones who spent our lives eye-to-eye with vacuum across a liner viewport, streaming for weeks between one and another of God's little acres.

So we had this camaraderie among us. I guess you could call it that. You'd meet a guy in some dive somewhere that you'd run across before. Maybe you didn't even like each other. Maybe in another kind of life you wouldn't have given each other the time of day. But in some dismal town, in a gravity-well full of total strangers, he'd say, "Maygan, you old sonof-a-bitch!" and suddenly you were home.

That was it, I guess. Drumming is a lonely life. It wears you down, and it eats you up from the inside. So you raise a little hell, blow off a little steam with some other jerk who's chained to the same wheel.

The result was that drummers had a rep in the colonies—something you could never live down. You didn't even try.

Lock up your daughters, the furnace man's in town.

That was my line—Fermi Furnaces. *The little blue box that tries. Why clutter your roof with unsightly solar tape?*

I'd been working the Great Circle for twenty standard years when I first met Barclimas Tragg. I remember it clearly because the district manager had just passed along a gold cravat pin from the home office. It said, "Dale Maygan—20 years" on the back. In English. The thing was supposed to tell dilation-corrected time in three different reference systems, but it never worked right. I may still have it somewhere.

Anyway, by that time I must have met a hundred drummers on a hundred different worlds. And a more mixed lot you couldn't imagine: smart ones, dumb ones, shirt-off-their-back kind, and ugly mean. Most of them were human. Or as human as someone in this kind of work can be. About Tragg—despite what he became—there was never any doubt. He was human all right, which shows, I suppose, what everybody already knows—that even among a crowd of aliens that look like a walking nightmare, not everything human is warm and cuddly.

I first saw Tragg standing in an oval doorway. He looked like a drowned rat, his strawcolored hair plastered to his forehead, with lightning crashing behind him.

Well, there's one I never saw before, I remember thinking at the time.

That was Pearldrop, a little mining world on the far rim of Nearspace. The colonists were descended from the crew of a single Pullman Sleeper a couple of centuries back. Somehow the small gene pool had survived the generations of inbreeding with only one small price: a legacy of stabilized albinism. The big commodity here was a pure form of graphite that ran deep into bedrock. The colonists spent their days in a deep, hot honeycomb, hewing out the greasy blocks. At sunset they emerged like soot-dusted ghosts, blinking their pink eyes and shivering in the slightest breeze.

Despite the blond hair and the long pale face, I knew right away that the figure at the door to the inn was no Pearldrop miner. He was tall and held himself with the kind of erect posture that you used to associate with the military. His eyes were deep-set and looked just the least bit wild. The overall impression was a strange mixture: both funny and disturbing. He carried a tattered satchel.

I was sitting at one of the tables near the back of the room with a half-eaten sandwich and a cup of mocha, adding up the day's receipts, when I looked up and noticed him. A few of the locals looked up from their meals.

The thunderstorm had been brewing up most of the day (I'd caught a few housewives with a story about solar tape drawing lightning) and had finally burst forth in a torrent just as the miners were ascending in the shaft lifts. It was pelting in sheets now, I could see. The kind of all-night storm that might flood the tunnels.

The strange figure in the doorway stood silhouetted by a flash and crack that vibrated the roof beams. "I need a room," I heard him say.

The innkeeper was a little old lady with a small nose, as pink as her irises, and a crooked mouth. She was a pleasant sort and a good cook, so I'd always made it a point to stay here when I was in town.

"Five a night, Franklins or gold," she said, wiping her hands on her apron and reaching for the key rack. "I don't take script."

"And something to eat," he said, stepping into the room and setting down his satchel with a wet sound on one of the empty tables.

From across the room I could just make out the printed label stitched below the handles:

POMPEII CURES

A SELECT LINE OF RESTORATIVE PREPARATIONS

ONE ONDAX, LEVEL SEVEN RIGEL VII

Snake oil man, I thought to myself. Rigel VII in those days was a haven for traffic in illegal medicine, fake cures, and faith healing.

"There's some soup left," the innkeeper told him. "Or I can make you land crabs and tubers."

"Soup," he said, eyeing us all distractedly as we stared back at him.

He was close enough now that I could guess his age. Late twenties, thirty possibly. It was slightly shocking to find somebody so young peddling that kind of garbage way out here.

A lightly pockmarked skin drawn across an angular face. High cheek bones and a narrow beak-like nose that might have been broken once. An ordinary mouth and not much of a chin. A little bit of a scar near one brow. The kid had been around it seemed. Somewhere.

I pulled out a stogie and unwrapped it slowly, tying the film in a knot and dropping it on the tabletop. "Care to join me?" I said, loud enough to be heard

above the rumble of the storm. I was frankly curious about this strange drumling from Rigel.

"You're talking to me?" The kid took a couple of steps closer.

I stood up and extended a hand, the stogie between my teeth. "Name's Maygan. Dale Maygan."

He hesitated a moment, unsure of me, or maybe himself. But when he walked over it was with a stiff-backed confidence. "Barclimas Tragg," he said, shaking my hand.

"You're a drummer. I noticed your bag."

"A what?"

"Salesman. They used to call us drummers. Some of us still go by the name."

The kid pulled up a chair, sort of climbing into it, all knees and elbows.

"Yeah, I'm a drummer then," he said, like he was trying on the name. He sat up straight in the chair, still dripping rainwater.

"I'm in portable power sources," I told him, digging a business card out of a vest pocket and flipping it across the table.

He stared at the card for a few seconds, finally wiping a hand under an armpit and picking it up. "Fermi Industries," he read, running a long finger over the raised letters. "That's a big outfit. I didn't know they sold door-to-door."

"Nothing beats the personal touch, especially out here. A lot of these colonies are too small to support a permanent dealership." I rolled the cigar in my mouth, studying his face out of the corner of my eye. "And what's your line, Mr. Tragg?"

He looked up slowly, and something about his expression told me that we both knew what he was. You learn to read people's faces in this business. A lot of times you don't particularly like what you read.

I grinned around the stogie and started to say something, but he blurted an answer. "Immortality," he said, meeting my eyes with a glare that surprised me a little.

"How's that again, son?" I really felt bad about smiling and tried to cover up by gathering my scattered receipts.

"I sell drugs," he snapped back. "Anti-senescence drugs."

"Company out of Rigel VII?"

"That's right."

I glanced up from thumbing through the pile of blue slips. Those deep-set eyes were boring right into me, and there was a hard set to his mouth. "You hoof that stuff around door-to-door?" I said, thinking *well, enough is enough with this kid*.

Something passed over his face, and his voice came in an even whisper.

"Are you mocking me, Mr. Maygan?"

I motioned to the lady innkeeper to toss me a towel. She flipped it over the counter and it landed between us. "Wipe your head, kid," I said. "You're all wet."

There were a few seconds of deadly silence where I thought he'd snap at me, or maybe even take a swing. But finally he picked up the towel and began rubbing at his plastered hair.

I fed the stack of receipts into a transponder and noticed that my fingers trembled a little. *What's the matter with you, Maygan?* I asked myself. *Letting a dirty look from a young punk jangle your nerves.* "So how's business?" I asked him in my best customer voice, tucking the transponder into a vest pocket.

He took off his dripping coat and draped it over a vacant chair. "Business,

Mr. Maygan... is lousy," he said at last.

The innkeeper set his bowl of soup down and bustled away.

"Sorry to hear it," I said.

I watched him attack the steaming soup as if he were starving and rolled the unlit cigar in my mouth. "Working the Great Circle, are you? Or just the local systems?"

He looked up at me and then resumed eating. A couple of minutes dragged out while he just ate and I just looked at him. "A small loop out of Rigel," he told me finally, between mouthfuls. "Alcor, Brab, the Quady League..."

"And then back along Willom, Milikan's Drop, Padua, and Bela's World."

He stopped eating, the steaming spoon poised. "How did you know that?"

I hooked a thumb in one of my vest pockets and retrieved a beat-up matchbook. "It used to be called the Danderill Pipeline." Named for a traveling carnival of a century ago, but I didn't tell him that. It was just the sort of route for an outfit like this Pompeii Cures.

The matchbook had stopped working months ago. I don't know why I kept it. I tossed it on the table and studied the unlit end of the stogie. They were getting too strong for me lately anyway.

"Not exactly the hub of galactic culture, eh, Mr. Maygan?" The kid resumed his assault on the soup.

"A lot of hayseed and coal dust," I admitted. "Still, all put together it's a sizeable market." I studied the back of the matchbook where the image of a naked girl in a champagne glass still winked at me.

A crash of thunder rattled the row of hanging pots behind the counter.

"You're originally from Rigel VII then, Mr. Tragg?"

You get that none-of-your-damn-business look from customers sometimes. You learn to talk over it, and they come around.

"There's some nice parks in the Ondax sector," I said. "I used to stop there all the time when I worked out of the Archernar System"

"I'm from Earth originally. My family shipped out during the Brazilian War."

I nodded, rolling the cigar. "A nasty business that was. They almost nationalized the home office back then. You must have been quite young."

"Just a... Yeah." He returned his attention to the soup.

"I was just starting out myself back in those days," I told him. "I was tagging along with an older guy back then, learning the ropes among the home sector colonies. We got the idea something was up when they started forwarding our transponder messages through Sao Paulo. Our pay was late, when it came through at all. We were writing all these orders, but it got so that we couldn't guarantee any deliveries...."

"Mr. Maygan, save your war stories for someone else."

I drummed my fingers on the matchbook and watched the hologram blow kisses. *Strange kid*, I thought. *He's never going to make it out here.*

"So," I said. "Maybe you have some story you'd like to tell me."

"I don't think so."

I hated to admit it, but the kid was getting under my skin. Drawing him out was a challenge now—like breaking down the sales resistance of a refractory customer. "Come on, kid. Everybody's got some story. I'll bet you've got a book-full. How'd you end up with this Pompeii Cures, anyway?"

He dropped his spoon into the empty bowl and looked up to meet my eyes.

After a few seconds of trying to stare me down, he let out a sigh. "I was discharged from the service. I was looking for work, but the economy's bad on Rigel VII. I answered a classified ad." He laced his fingers behind his neck and arched his back. "See, Mr. Maygan. No story. Just one of the faceless trillions out here."

I studied the strange grin on that long face. He seemed to be enjoying some private joke.

"So what special forces unit were you in?"

I caught him off guard with that; the smile vanished.

He looked at me quizzically for a moment, then laughed. "That's pretty good. It was the Cayman Corps, as a matter of fact. Our namesake was a rather nasty reptile, if you didn't know. From South America. Aside from the alliteration in the name, it was a symbol for liberating the homeland." He tipped his chair back. "That was very good, though. I didn't know my sojourn with the military had left that much of a mark."

I shrugged. "Regular army doesn't stiffen a man's backbone. You're too young to have been a career officer. It had to be one of those lean-and-mean programs." I took out the cigar and examined the wad I'd made out of the chewed end. "You learn to read the signs."

"You're right, I wasn't in very long." The kid's deep eyes got a sort of lost look. "Brasilia fell three days before I graduated training. I sat out a year at Fort Humphreys on Ross 154A. The Eurasian Alliance never did need an outsystem invasion force to reclaim the Western Hemisphere."

I had to chuckle. "All dressed up and no world to conquer."

He didn't react to that, still half lost in thought. "I could have been an officer, Mr. Maygan. I was good. They all said I was very good. But commissions don't come easy nine light years from the front lines."

"I guess not," I said. "So you sat out your term and moved back to Rigel VII?"

"My parents were settled there. They weren't going to move back to Earth. I figured that maybe I could get some kind of education there."

"On Rigel VII?"

His eyes came back and so did the cynical smile. "A bit naïve, wouldn't you say? I ended up needing money. Pompeii Cures and I found each other."

"And you've been on the road for how long now?"

"Two standard years. Just a bit more." He sat forward and his face changed again. "The drugs work, you know. They're derived from some folk medicines...."

"Sure they do, kid."

"I've seen the effects," he said.

"I don't doubt they showed you something. From what I've read there're a hundred ways to extend lifespan. But we're talking twenty-five, thirty years." I met his eyes, my face serious. "No matter how you cut it, son, that's a long way from anybody's definition of immortality."

He remained silent at that, his thin lips working just a bit. "You're selling false dreams," I said, not looking away. "I think you know that."

His mouth set in a hard line. "And what if I am?" he said. "Aren't they better than no dreams at all?"

I shrugged. "Depends. For some, maybe. So long as they don't hock the family tractor to give you their money."

The line spread into an ugly smile. "Business ethics from the drummer's code, Mr. Maygan? Is that what you're quoting?"

"You're playing with people's fears. You're promising something you can't deliver."

The kid leaned forward, that straw mop falling back down on his forehead. "And what are you selling, Mr. Maygan? Don't you talk customers into parting with their money for things they don't really need? Isn't your product designed to fail soon after the warranty expiration? And isn't it repairable only with parts obtained through your company's distribution centers?"

"Your first point is arguable," I said. "The others have names and a history: planned obsolescence and vertical integration of product line. The issue is that my product does what the company claims."

He fumed in silence. This wasn't going anywhere. I pulled out my order book and scrolled tomorrow's itinerary.

"Why don't you try some other line of work, son. It's cold and lonely out here."

"I don't fit the mold, is that it?"

There didn't seem to be any point in pulling punches now. "I'm afraid not, son. Salesmen, drummers—we've got rubber in us. We bend easy, but we resist breakage. I've got a feeling that you don't bend much."

I glanced down at the flight schedule, wondering just how the kid would react to a taste of the truth. Tomorrow, I noticed, I'd have to be up before dawn to make shuttle connections for the next mining town, halfway across the planet.

When I looked up he was still staring at the tabletop, shaking his head. "I'm asking myself why I'm sitting here talking to you, old man," he said.

"What do you want out of life, son? Have you asked yourself that?"

It was another long moment before he responded. "Once upon a time," he said, "an Earthman named Schopenhauer said, 'the world is my idea.' He followed that with an even more startling notion: that essence of reality is Will. That's Will with a capital 'W', Maygan. Some time later another man named Nietzsche turned it into a lifelong poem about self mastery. There were others, even some in this century, that elaborated on it." The wild look had returned to his eyes. "There's a difference between humans that is one of kind, not degree. Take you and I, for instance..." Suddenly, his eyes focused, his brows knitted. "Do you have the slightest notion of what I'm talking about?"

I snapped the order book shut and put it away. "I've read a book, kid," I said. The *Übermensch* that fellow Nietzsche wrote about—is it anyone we know?" I took a last sip of the mocha. It was bitter and cold. I'd had enough of this. "I think I'll be turning in," I said, standing up and stretching. "Common men require some rest." I turned to go, then I stopped. "No offense, son." I felt sorry for him then, I guess. "We're on different wavelengths, but I wish you luck."

I stretched out my hand, and amazingly, he took it. I gave him my Number One Handshake, grin and all. "God grant us both the power to cloud men's minds, Mr. Tragg." It was the old drummer's drinking toast, and I regretted saying it as soon as it was out.

I didn't see Tragg again for many years, but that same night in my room at the inn, laying in bed—above the roar and boom of an electrical storm—I became gradually aware of another sound. At some point in the night I found myself sitting up in bed, staring at the random flashing beyond the rain-pelted window. In the silence between the thunder crashes, I heard a muffled sound—the stifled sob of someone or something in the next room. I blinked in the

darkness, listening perversely to someone's pain. The room on that side had been unoccupied when I'd checked in the day before. Could it have been given to Tragg? Finally, I laid back down and tried to shut out the sound, to cloak it over with the tumult of the storm, but it continued, rising out of each silence. I laid awake most of the night, my thoughts racing.

It was near dawn when the storm abated, and I was just managing to nod off to sleep when my ringphone buzzed. I jammed my right hand under the pillow, but I knew I'd be getting up. The muffled voice of the lady innkeeper reached my ear through the down and linen: "Mr. Maygan, you left a wake-up call."

I crawled out of bed and began to dress slowly in the dark until it struck me that I had an early shuttle to catch. Then I was off like a shot, still buttoning my collar as I bounded down the stairs, my suitcase obediently two steps behind.

It never occurred to me to ask if Tragg had been given the room next to mine. I paid my bill, and, with a wink at the innkeeper, I was off toward the launch-port through a damp, sunny dawn.

Time moved by, and with it worlds and faces, but that first brief meeting with Barclimas Tragg never completely left me. I can't really say why. He didn't haunt my dreams, or anything that dramatic. But sometimes, in a second-class bunk, trying for sleep, pressed against the padded bulkhead, I'd see him standing there in that oval doorway with the storm flashing behind him. It was funny how the image of that kid stuck in my head, an immiscible mixture of fear and laughter. I dismissed it all as a pointless fixation a dozen times or more.

Five years passed. I was getting old and paunchy. I knew the territory like the back of my hand. I came to know worlds like people know people. And I sold more Fermi Furnaces than anyone had ever sold Fermi Furnaces door-to-door. The district manager sent me an emerald-studded cravat clip. And that one didn't work either.

I married a woman once. And once I bought a power source dealership on a little green world. Neither arrangement lasted very long. The woman ran off, and the dealership was a financial bust. Each time I hit the Great Circle again.

It was on the stretch run, coming out of the Near Arm through some of the back country worlds—Ritteau, Windblossom, Lesser Ptal, and Banceum—that I decided that, as long as I was in the neighborhood, I'd take a quick shunt trip to a little place called the Kinsman Anchorage. It's a planet roughly half Terra-size but with a dense core so that the gravity works out to something reasonable. It's sort of an obscure place; the binary is a type A1 that only has a number on the charts. Most people have never heard of the place. I'd been there once or twice before.

A lot of fast rivers drain from big caldera lakes into a southern hemisphere sea. Cheap hydroelectric power feeds a primitive power net for the two principal cities. Not much of a market for Fermi Furnaces, and most of our sales force avoided the place. The natives were resettled neocolonials from one of the New Coalition Worlds, but there was a broad sprinkling of alien races.

Igneous lava plains made most of the surface unsuitable for farming, although there were fertile valleys to the south where all the food was grown. The two cities were sprawling, densely populated bergs: Chork City in the north and Norlans eight hundred kilometers away to the southwest. Chork City had

been a dirty place when I'd been there last, maybe ten years before, and already from a height of fifty miles, I could tell that nothing much had changed.

A black pall from primitive foundries and chemical plants churned out smoke and fumes. Here and there luminous flames from refineries glared up through the fog. We slid into a lazy arcing approach over the business sector, and I watched, fascinated, as tall stone buildings—skyscrapers, they were called—reached up toward the liner window like praying fingers through a miasmic haze.

Centuries ago, Chock City had been a major refueling stop for merchant class vessels, but now freighter traffic had declined, and only one irregularly scheduled passenger line out of Banceum remained in operation.

As I collected my belongings from the overhead rack, I caught the first scent of the place from an open hatch somewhere—an oily, charry smell and a sulfurous astringency that became a taste at the back of my mouth. Air quality sensors clicked, and the liner's ceiling circulators upshifted to high speed. There was a mounting titter of coughs and throat clearings among the debarking passengers, and in one of the forward compartments, a small child began to cry.

As the port walkway streamed us through the terminal, I found myself scanning the sea of faces for some beaming grin, some eddy of good humor. It might have been there, but I didn't find it. I joined the line at the customs table. It moved rapidly—a cursory scan for disease and fissionable materials. What other evil could anyone bring here?

I took a pallet in the most sanitary accommodations I could find without a reservation: a communal flop on the thirty-sixth floor of a converted office building. Ten Franklins a night with bathroom privileges. The economy here, like so many other things about Chock City was running out of control. The lift worked only half the time, and one man seemed to be living on it.

I found my cot after stepping through a maze of scattered luggage and prone figures in the large, darkened room. A curtainless floor-to-ceiling window dominated the near wall. Through it I could see swarms of air carriages nosing like fireflies among the city monoliths. Occasionally, a set of headlights would cast eerie shadows across the mattress rows.

I shut off my suitcase and tossed my coat next to where it settled, then laid down fully clothed, hoping that sleep would be possible. I closed my eyes and listened to the white noise of the air conditioning. Someone nearby woke to a coughing fit that lasted several minutes. I opened one eye and stared off into the dim shadows, watching the dark shapes of sleeping strangers—mostly human and mostly male. It seemed that individual identity was lost here, a sense that life was cheap at this density. You begin to feel yourself dissolving into the sentient porridge. There was a twinkling light in a far corner: some guy had a holocube set up, and little pastel figures were dancing on his chest. All of us, I suddenly realized, were trying to pretend we were alone.

Morning in Chock City begins with the sound of steam whistles. Many walk to work here: a blank-faced procession of immense proportions that moves more efficiently than the gridlocked surface traffic. The air is alive with the frantic swarm of flivvers and carriages.

I managed to hail a cab after being cut off twice by locals who were quicker and better schooled in the game. We rose up and over the business district, streaming out into the massive ring of heavy industry. Refineries, textile mills,

ore smelters; the chimneys and cooling towers all swathed in an evil-smelling haze.

I talked the cabbie into waiting while I tried a few remote prospects—small machine shops that might feel the pressure from utility overhead, and engineering firms that might need portable power at construction sites. But no luck. All wells were dry. No business, no leads, not even many polite smiles.

Domestic sales were out of the question here. Private home ownership was virtually nonexistent, and those rich enough to afford a private dwelling would be unlikely to be concerned about utility bills.

We glided on, the bored cab driver eyeing the mounting tally, but talking very little. I peered out of the back window through a fine matte of yellow droplets that had condensed on the glass. The landscape that inched by a half mile below us could have been Numars of a hundred years ago, or even Pittsburgh in the nineteenth century. This city was an eddy of frozen time. If it died, no one would mourn.

It was nearly noon, and I was sitting in an office waiting room at one of the big smelters that hugged a meandering river. Through a large window I was watching steam rising from a settling pond, and just beyond it a dark stain spreading on the river. I suddenly decided that I'd had enough. The receptionist console eyed me as I stood up. "It will be a few more minutes, Mr. Maygan," it said

I walked out of that office without a word. That wasn't like me at all; I'd always made it a point to leave a professional impression on clients, but somehow it didn't seem to matter. I needed to get out of this city.

The cabbie dropped me back at the skyscraper flop where I had secured my baggage for half a Franklin, then I hopped back in for a ride to the launch-port. My mind was wandering as we streamed through the lunchtime traffic when something caught my eye. It was a flat-lettered marquee in front of a shabby-looking theater. The place was closed, scraps of wind-blown debris had collected against the locked doors. I only caught the briefest glimpse as we rose past, but it was enough.

"BARCLIMAS TRAGG," the sign said, "CHOCK CITY CRUSADE." And then: "CHOOSE AND BE CHOSEN!"

I caught the afternoon shuttle to Norlans, the seaport to the southwest. The rivers exhaust most of their energy by the time they reach that area. The last hydroelectric station is a hundred miles to the north. If there was any kind of market for Fermi Furnaces on this world it would be there.

And besides—as I recalled, the place even had some style. Overcrowded, yes, but not an ant colony. Here the industries were mostly based on biomass fermentation for food and pharmaceuticals. Norlans had some nightlife, some decent restaurants, and even a couple of small parks. Here I could stay a day or two, I thought, and feel somewhat at ease. I might even make some sales.

I checked into a really decent high-rise hotel that boasted carpeting and private bathroom facilities—even balconies on some of the better rooms. At great peril to the credibility of my expense account I opted for one of these. Chock City had left me desperate for space and privacy.

That night I luxuriated in the expensive solitude, pacing the floor in my stockinged feet and sipping at a bulb of some sort of green fruit juice. Aside from an occasional rumble of turbulent flow in the bathroom pipes, the soundproofing was perfect. It made me realize what a noisy place this world

was.

I flicked through the frequencies on the holo-set, finding nothing that caught my interest. I dialed up a book I'd started reading on Banceum—a tired self-help text called *Empathic Salesmanship*—but that got tiresome after two pages. Then I paged through the phone directory looking for leads. Nothing jumped out at me from that. Finally I snapped the set off, bored and a bit disgusted. I walked over and opened the heavy drape that covered the glass balcony doors.

Darkness had fallen on Norlans. It was quite a picture. The nearby buildings were mostly tenements, the fireslides lighted with pinpoint reds and blues to ward off swarming carriage traffic. The streets, twenty stories below, were a geometric maze of headlights and taillights. In the distance, the harbor was a swath of blackness trimmed with the porthole lights of big ships in dock.

I slid the glass door back and stepped out on the balcony. The polycrrete was still warm from the relentless heat of the afternoon and felt gritty under my socks. A gentle night breeze brought coolness and a faint fishy smell. In the distance, I heard the mournful hoot of barge traffic.

I lit up a stogie and leaned on the railing, studying the intricate nightscape. I felt an odd contentment, as if I was the sole observer of a majestic artwork. Was I becoming insular in my old age—a rebound from the press of life? What an ironic turn of fate that was. A fatal flaw in a salesman. I pulled on the stogie, watching a burst of wind explode a bit of spark and ash from the glowing tip. Alone in a crowd of strangers—hadn't that always been my lot? And now it was my comfort. I'd met and talked with thousands on a hundred worlds, but who loved me? And who did I love?

Strangely, I thought of Tragg again. That cold, walled-in stare of his, past me, past everyone. He was out there somewhere in this city, I somehow knew with certainty. And the chilling notion came that somehow the two of us were not that different.

From somewhere below, a freak of wind brought a raucous swirl of music. Something like the honk and squeak of Nearspace Jeep of a few decades back, but with some new snap added. It seemed to bring me around. It sounded good. I thought I heard people laughing.

Somebody's having a good time, I thought
Maybe I didn't really want an evening of solitude.

The Piebald Tavern, the hotel doorbot had said. And after a short walk down a street full of partygoers I found the sign swinging gently from a wrought iron bracket. Stone steps led down below street level into the basement of a decaying building. The door had been removed from its hinges, and noise and light glared up onto the sidewalk. A Carnosite couple—what convention called male and female—brushed past me and descended into the opening. Chock City had taught me not to hesitate—you tended to get knocked down by somebody behind you. I followed them down the steps.

Probably typical of Norlans bistros, the place was smoky, noisy, and crowded. An array of glaring holograms decorated the back of the bar: animated advertisements for spirits and potions in a rainbow of colors that tinted the wafts of smoke that drifted past them. The place was dark and cavernous and jammed with people. There seemed to be a large assortment of off-worlders; I noticed alien types from ten worlds at least. A broad spectrum of human stocks

as well, mingled with the gene pools of the furred, the feathered, and the flowered.

I took a seat at the bar, slipping in quickly to fill a vacancy when somebody got up to weave toward the door. The gimmick of having a human bartender had spread this far. Or maybe Robotend's sales force had never even gotten out here. I ordered a Canal Sour from the little guy working like a crazed alchemist back there. The place was stifling, I suddenly realized, as he set the sweating glass down in front of me.

I swung around on the stool to size up the room. A three-piece group was getting set up on a small stage in the far corner: two girls in mirrorcloth jumpsuits and a really gigantic Muldivian. "Piggin Prime" it said on the side of the autolyre. The girls were pretty, the Muldivian most decidedly was not.

I felt a strong nudge in my ribs. "Terran? Am I right?" It was a Windseeker with a badly healed scar across his muzzle. He must have climbed into the next barstool while I'd been looking away. I turned to him and nodded.

"I can always recognize the look," the alien said, big eyes blinking in that raccoon mask.

"It shows, huh?" I'd run into the type before.

"Written all over you." He barked a drink order at the bartender, then extended a formidable looking paw. "I'd give you my name, but you haven't got the larynx for it. Pisbaw's close enough, I guess."

"Maygan," I said, watching the claws as I shook with him.

"Pleasure. Really. We got some strange birds coming through these days from out your way. It's nice to see a regular fellow from Terra once in a while."

Something inside clicked at that. I watched the dancing colored lights above the bar and felt a drop of sweat roll down my cheek. "Is that a fact?" I said.

"What sort of strange birds?"

He squinted at me and showed his teeth.

"No offense meant by that now."

I wiped at the perspiration. "No, really, I'm curious," I said.

He snagged a glass and drained half of it with a noisy slurp. "Well, like this fellow over in the park tonight. Posters and 'cubes have been set up all over town for a bunch of days now."

"Barclimas Tragg."

"So you know about it."

I took a sip of the Canal Sour and returned the glass to its puddle on the bar. "I've heard the name," I said. "What's it all about?"

"Beats me. Some kind of revival meeting is what I heard. Ten solar, out in the War Memorial Amphitheater. The guy must be some kind of screwball. Claims to be a prophet or something. Some new religion, I guess." The big eyes stared thoughtfully into his half-empty glass. "We get those from time to time you know. Usually, it's a Terran. Or a Terran turns out to be behind it."

"Really?"

He scratched under his chin with a scraping sound. "No offense, but it's true. People get taken in by that kind of thing, you know. Real shame... We're hurting enough out here without that kind of stuff."

"Ten Solar, tonight?" I glanced at the time on my ring.

"Right." The alien drained his glass, then turned to me with a curious look. "Hey, you're not into that mumbo-jumbo stuff too, are you...?"

The music started then, drowning out the rest of what he said. I stepped off

the stool and tossed a bill on the bar.

"I just want to see what it's all about," I said, but I don't think he heard me. He was looking into his empty glass and shaking his head as I walked toward the doorway.

At ground level, Norlans was a maze of winding streets and dead-ends. Old stone buildings and dim streetlamps. I don't know what made me think I could find my way around on foot. The sidewalk crowds had thinned out; the lighted storefronts and noisy saloons were behind me. Vague shadows huddled on the steps of buildings, watching me as I passed. I heard shouts in the distance, echoing between the buildings, but I couldn't tell the direction. Looking up, it was all balconies and fireslides: wash hanging, bare legs dangling. Up and up it went, rising from both sides of the street until it blurred into a narrow gap of stars.

I could see the harbor down at the foot of one of the side streets I passed—half a city away, it seemed—a black emptiness sprinkled with the running lights of tankers and those precise arrays of liner portholes.

That gave me some confidence in my bearings, and I began to increase my pace. It got darker and quieter. I found myself tensing at the sound of running footsteps, then relaxing as they diminished into the distance. I kicked something—a metal can possibly—and I heard it go clattering off into the shadows. I was almost running now, my breath heavy in my chest.

Then: a bright light in my eyes. The sound of a lift field. "Need any help, sir?" a speaker voice said. It was a police carriage, settling slowly into the street.

I squinted into the light, shading my eyes. "I'm looking for the War Memorial."

"You missed the turn," the voice said. "One street back."

"Thank you."

The light snapped off. "Be careful, sir." The whine changed in pitch as it lifted away.

The park formed a large air well among the surrounding buildings. I think it must have been octagonal in shape, but on foot it was hard to be sure. Lamplit pathways led like spokes through the trees toward a large bandshell structure in the center. A row of cabs were parked along the street, the drivers leaning on the roofs or talking in small groups. There were few other people around.

I glanced at my ring. Five after ten. Whatever crowd Tragg had attracted was already in place.

The path was cool, and it was good to hear the rustle of leaves. As I came up toward the back of the bandshell I began to hear the amplified voice of Barclimas Tragg:

"... lying hidden within every sentient being in the Universe. The life force of all creation..."

A circular path that intersected all the radial walkways led me around to the front where a sea of park benches faced the stage. The crowd was small and scattered, with a small knot of people grouped in the first few rows. Tragg stood alone at the principal focus of the huge bandshell. He was dressed in a ridiculous white robe, his gaunt features accented by improvised footlights. He paced a short distance back and forth as he spoke, hands waving in quick jerks. A rise in his voice caught my attention:

"You are dreaming, people! You are asleep right now and don't even know it!" He quickened his pacing until he looked like some sort of caged predator. "You are dreaming that you are a cog, an insignificant bit of flesh in a vast unknowable Universe. You whimper in your sleep and beg the titanic forces to spare you from being crushed. I am here to wake you to the truth!"

I leaned against a tree, and my hand touched metal. A small stainless plaque was embedded in the bark: *NO. 17, TERRAN WHITE OAK.*

"You created the Universe!" Tragg was saying. "You hold it in existence by the unseen power of your own life force!"

The crowd seemed bored and restless. I noticed a few heads leaning together to talk. Tragg might have sensed that he was beginning to lose them. He was talking faster now, moving even more animatedly. "Time is a lie and death is an illusion, my good people! Only the herd, only the dreamers die. There is no death, no sickness, no pain, no infirmity...."

"He doesn't look too healthy to me," I heard somebody say as they were leaving. A titter of laughter ran through the crowd.

Now Tragg was fooling with a small box. He looked truly pathetic in that white robe, hunched down on the stage, attaching a bracelet of some sort to his wrist. *So superman has come to this*, I thought. *What would your boy Nietzsche say, kid?*

Tragg returned to center stage and lightning crackled from the fingertips of his right hand. "The power of the Life Force!" he said and stretched out his arm. A ball of blue fire rolled out of his palm and floated over the heads of the crowd, sizzling and snapping in the damp night air. Finally, an old man poked at it with his walking stick, and it faded.

"Wake up, people, to the power within you!" He raised his hand, fingers spread and a fan of blue sparks streaked up into the night sky. "The power of truth!" He shot a finger at an empty malt can laying in the aisle, and a blue bolt from his finger missed it clean. On a second try, it exploded in a shower of yellow sparks.

Nobody in the crowd seemed impressed. They were leaving in small groups now, drifting toward Norlans' night streets.

There's a point you get with a customer where you know you're not going to make a sale. At that point, you shut it down quick and pack it away. Time is *not* a lie, drummers know; time is money, and too much time on a lost cause kills you. Tragg had lost them all, but he kept right on talking.

"... donations to our headquarters on Rigel VII. The address is on the leaflets you were given earlier...."

I watched their faces as the crowd streamed away. A few were smiling and shaking their heads, but most of them looked sad and disappointed. He'd removed another hope, drained their lives a little more.

There were maybe a dozen people left, scattered around the benches. Incredibly, Tragg was still talking. "The Church of the New Creation is your guide to this awakening, for it is a difficult road alone, people..."

I walked toward the stage and stopped at the foot, looking up at him, waiting.

It took a moment, but when he noticed me he stopped in mid-sentence. We stared at one another in silence, a gentle breeze blowing that yellow mop of hair. He looked older now, I saw, considerably older. He recognized me, that was sure. I could see the nostrils working in that beak of his, though I couldn't read his

expression: shame, hate, despair, arrogance? They all might have been there. It was an interesting moment—cathartic for me, I thought at the time.

He cupped his hands together and looked down at his fingers. I realized then that that electrical gizmo was still attached; that he could probably kill me with that thing at this distance. The danger ran through me, even though I didn't believe he would do it.

"Hello, Mr. Maygan," he said, still looking at his hands.

"So, how's business, kid?"

After a moment, he looked up and smiled. A terrible smile that was.

"Business... as you can see... is lousy."

The old man with the cane shambled out of his seat, coughing. The other hangers-on were leaving too. The show was over they finally realized.

"Sorry to hear it, son, I really am." And I was in a way. In that moment, Tragg was the most pathetic creature I'd ever laid eyes on.

He unbuttoned the robe at the neck and let it drop away, then loosened the wristband and let it fall onto the bunched cloth. He was wearing a skinsuit underneath, and I swear I could see his ribs. He hunkered down onto the stage floor and dropped his long legs over the edge. "Did you enjoy the show, Mr. Maygan?"

I took a seat in one of the front row benches. "Seems like you're still selling the same line in a different package."

He shrugged. "Immortality? It's an old line; it's been on the market for centuries."

"Not just that," I told him. "You're selling yourself, too. You're still trying to prove that you're a different breed than all the rest of us. Qualitatively different, I think would be the term. You want to rub our noses in it."

His response surprised me. "You're right. Childish, isn't it?" He swung his legs and looked off into the dark trees. "I can't help myself, you see, Mr. Maygan, when everyone else seems so tiny and insignificant." His voice was calm and even, his eyes lost in some dark distance. "Have you ever looked at a man and seen an object, Mr. Maygan?"

That gave me a chill, but I smiled at him. "Is that what you see when you look at me?"

He stared at me then looked away, the question answered. "You're better than most," he said. "I sense something in you beneath that pitchman's mask. But you're still an eye blink—another cipher in the galactic tally." His voice was soft, and his eyes were wild. "Tell me something, Mr. Maygan..." I waited. "Do you ever have bad dreams?"

I felt a tremor run through me with the next puff of wind. I really believed that I was talking to a madman. "Everybody does, kid," I said.

"I've had the same dream for..." he waved an arm, "oh, years now. It's the Brazilian War. I'm fighting in the Matto Grosso, leading a platoon. It's dark—the jungle canopy overhead. We're tired and lost; the men are scared, depending on me to get them back to the main company. We're lasering through the undergrowth. Maybe we're going in circles, I can't be sure." He raised one leg onto the stage and rested his chin on his knee. "Then there's a sound, like something whizzing through the air. A rocket grenade lands right in the center of my platoon. I run and throw myself on it. I lay there for seconds, holding back a scream, feeling that metal cylinder under me." The deep-set eyes flicked toward me, then backed away. "In my dream then one of my men leans down,

close to my ear and says, 'Bang!' Then they all break out laughing."

He sat there, impassively; immobile except for the breeze tossing his hair.

"Does that explain something, son?"

He nodded—the slightest motion of his head. "I think so. But, you see, the psy chopathology of the situation doesn't matter any more. That's playing the game. No, Mr. Maygan, I told you about my dream because I wanted you to believe something about me. I'm not a fool and a charlatan. If I had been permitted to fight in the war, I would have fought bravely. And under the conditions in my dream I would have sacrificed my life for my men. And I would act similarly today for some sufficient, though quite different, cause."

"Did you ever consider getting some help, son?" I said. "You've got a lot of painful knots in you that need loosening."

He smiled, as I expected. "You recommend a heart-to-heart with a psychoanalytic program, do you, Mr. Maygan? Bare my soul to some programmer's logic tree?" He was staring right at me, and though I tried to meet his gaze, I found myself looking away. "You're really quite a termite after all, Mr. Maygan. Your fetching concern for my peace of mind is really the instinctive way the colony reacts to the threat of aberration. You've sniffed the scent of an invader and your alarm pheromones are triggered."

I stood up and glared at him. "Damn it, kid, I'm trying to help you! You know you need help. Somewhere, inside there, you know it. There's still a piece of a human left under all that horror...."

"The horror?" His face changed into a strange frown. "The horror... What an interesting choice of words..." He seemed lost somewhere, almost unaware of me. "Yes... Conrad..."

"Who?"

He looked at me one more time, swinging his legs like a little boy. "I think that will be all, Mr. Maygan," he said. "You may go."

I don't remember much of the walk back to the hotel. I found my way back through the city without getting lost or assaulted. I was trembling a little when I locked the door behind me. The day had finally gotten to me—I threw up in the bathroom sink.

I caught the small commuter to Banceum the next day with nothing to show for my stay on the Kinsman Anchorage except a literal and figurative bad taste in my mouth. I returned to my round of routine calls on the Great Circle resolved that I'd now purged myself of Barclimas Tragg. There was no reason to think of him any more, except with pity. And I'd come to realize something about myself—I was no misanthrope. Life *is* a terrible thing without the need for love.

I was approaching the half-century mark, and I'd been drumming since I was nineteen. It was no life, really; I'd always known that. I'd always told myself that I was going to settle down. I'd even tried it a few times, but something had always gone astray. Now I was getting old, and my gut couldn't take much more liner food, and stogies, and bad booze. I was tired and lonely. It was time to settle down for good.

Back to old Gea-Tellus. Back to the birthland. Back to... what?

I was a bit confused, as they say men sometimes get at my age. I wish I loved somebody back on Earth—that would have made it easy. But there was no one left anymore. The old blue ball was just another liner stop.

And yet, there were memories:

The intricate sandcastle I'd built once at Big Sur on a family picnic. The next day the Pacific had eaten half of it. I remembered how impossibly blue the sky had been.

And dolphins breaking water in the Straits of Bosphorus, following our launch for hours.

And those majestic red sunsets, day after day, coloring the sky above the Canadian Rockies. Some Hawaiian volcano had painted them. I must have been all of ten years old.

And Mother being so scared of those suborbital jaunts when Dad got some time off. "Edna, you're such a child!" She was. She was beautiful.

Yeah, I'd go back. There was peace there.

And I did, but it took five more years.

A district manager's job was the key. The first one came up within the year. It would be between me and Duhan—a red-faced Carolinian who had been pushing the Circle since he was a kid, with a sales record that was damned impressive.

This guy had just signed the Marseke Asteroids to a five and nine contract for the next standard decade. And I had just managed to tie the knot on Vega IX's power consumption for the colony's term. Two equally respectable tally sheets, with the home office dangling the promotion carrot before the both of us.

So Duhan became an enemy. A man I hardly knew.

I was coming off a Nearspace run: Ho Rika, Arcturus Five, Faraday—when I got the news. Orion was at war. Or most of him. Suddenly, there were a lot of bad scenes on a lot of old familiar worlds. A lot of old friends weren't your friends any more—because of the war. I started seeing a lot of people in uniforms. Commercial liner traffic was disrupted. Long delays. Reroutings. Unscheduled baggage inspections. Whole systems were closed down. Some would let you in, but not out again. A few worlds were under martial law. A lot of them had daily civil defense drills, nightly blackouts, and restricted surface travel.

The passport and visa situation quickly turned into a nightmare. I was carrying identification cards in every pocket and still found myself in some sort of trouble half the time. The home office newsletter was frantic with updated travel regulations and was usually several weeks behind the changes.

I saw the drives of the big dreadnaughts through a liner window once—eye-searingly bright from maybe a million miles away. And I saw worlds encircled with armadas so large it seemed their sky must be black with iron.

It was a tough time. And a ridiculous time to try to sell anyone anything. I worked my way as quickly as I could toward the edge of the conflict. But the war was spreading, alliances were shifting rapidly. Neutral systems were choosing sides.

The politics of it eluded me. Territorial domain, right of free trade passage—the catch phrases from the news reports never coalesced into anything that made sense. Earth, to my surprise and relief, remained neutral through it all, offering her services as mediator finally at the end when the combatants became too weak to bludgeon each other anymore.

But it took five years. There were times when I was scared speechless, and there were times when I was beyond fear—numb, and functioning without thought. Days and weeks of both. I won't go into that. It took me nine months to reach Brindley—a big planet with a small fledgling colony clustered on a little peninsula. They were on the edge of the war and completely out of the politics

and trade that had started it all. They were too small to be bothered with—less than a hundred thousand, humans and Carnosites, grubbing out a living from marginal soil and sickly looking plants. I became one of them.

For almost four years, I ran a tractor and sweated under a yellow sky. They accepted me, they taught me. And they changed me. I learned for the first time that there could be something clean about getting your hands dirty. I learned to pray for rain and offer thanks for a harvest. I learned to share in joy and sorrow, and to touch and be touched by other lives as I never had before.

And then the war was over.

It left me stunned at first—the realization that free choice had opened up again; that I could leave this world that had accepted me so readily.

After several failed attempts, I managed to get a cable through to Earth. Fermi Industries had given me up for lost. The business, like many, had weathered the times with in-system and home sector sales. Duhan had been killed three years ago, trying to make it home with a small merchant fleet that had tried to run a militarized zone. The district manager's position was still open, and it was mine if I wanted it.

I still remember standing there in that makeshift transponder office, sweating from the heat, fans blowing the print-out film so that I had to hold it with both hands. A small favor, they wanted. A brief stop-off on the way back: the Hazinrih System—a big order for three power-starved worlds. They'd been getting urgent inquiries for the last six months. Their nearest man wasn't able to get travel clearance out that far. It would be on my way home.

I stepped away from the counter, and the line moved up. I walked past them, nodding recognition and smiling to each in turn. I knew many personally, most of the others I at least recognized. They felt like friends, and it hurt to realize that I was leaving them.

But this wasn't home, I told myself. There was one more wrenching step for that.

I wept when I left Brindley, knowing I'd never see any of them again, watching that little green tongue of land diminish into a cartographic detail through the freighter port. Knowing that even on Earth I'd be lucky to find that kind of peace again.

The freighter dropped me at Bethe 9, just inside the demilitarized sector, where I rapidly became entangled with travel permits. I spent several days being transferred between waiting lists for flights Earthward. I finally got on a converted troopship headed for Su-Tango, a Muldivian world heavily ravaged by the war. More waiting, more papers. Then a hospital ship found room for me on a run to Tau Ceti. Things were still in a mess there, but at least there was some kind of regularly scheduled traffic. I wired Fermi Industries for money from the big New Madrid spaceport, and then managed to hire a charter service that had just restarted its operations to take me as far as the Hazinrih System.

I checked my appearance in the privy mirror just before planetfall. The four years of farm labor had given me a tanned and craggy aspect like those character-filled portraits by the old masters of the American Period. I was a little surprised to see how much I had changed. I was ready for the sedentary life, I knew now with certainty—that Earthside district manager's job. The old suburban picket fence scene. It had made me shudder in my youth. Now I knew that I had missed something.

It was the years on the Great Circle that had aged me, not Brindley's sun. I wanted now to spend the rest of my days with dirt under my feet. Terran dirt. Just maybe there was still time to grow some roots.

But there was this one job yet before any of that was possible. I straightened my cravat, wondering if there was still enough of a salesman left in me to close the deal.

I had checked the General Information Atlas on the Hazinrih System, using the holo-set in the captain's cabin. The place had just opened up in the last decade or so. There were three Moon-sized rocky worlds in close orbit around an old, dim star. It had been explored centuries ago by a Moslem sect fleeing religious repression on Barnard. They'd stayed for a few years, then abandoned the place and went on to found the colony on Burada. The system had remained uninhabited for almost a hundred standard years. Then a private consortium of some sort had moved in about twenty standard years ago and made legal claim to the entire system.

That was about all I could find in the Atlas except a lot of map surveys and physical data. Dialing up the *Times* back-issue index was a lot more productive. Out of the last twenty entries on the Hazinrih System, nineteen were cross-indexed with the name "Nairam." Ons Nairam, to be precise—the Carnosite member of the consortium who had bought out the other partners to emerge as the individual who owned a solar system. He was immensely wealthy, and there was the cautious suggestion that some of his financial sources may have been less than legal.

Just before the war had disrupted things, two of the Hazinrih worlds were beginning to emerge as major resort areas under Nairam's astute guidance. He'd built huge hotel complexes along miles of stunningly beautiful beachfront property and had filled in support and service industries of all sorts. According to the press releases, tenant farmers supplied with the latest robotic equipment would provide 90 percent of the food. Other necessities would be ferried out from Tau Ceti or other nearby centers.

The growing affluence at some of the older galactic colonies would supply an endless stream of tourists seeking an idyllic respite from their gristmill lives. And line the pockets of Ons Nairam. That, at least, was the impression from the news releases: entrepreneurship on the grandest scale with a strong likelihood of success.

Except Nairam hadn't counted on the war. As we slipped into a descent path over the innermost planet—the one he'd christened Agah—I realized that Nairam's vision had been short-circuited. We'd gotten immediate clearance for the approach, so there couldn't be any traffic to speak of here. And as the blue and green mottling resolved itself into continents and coastlines, I saw little sign of Nairam's mark on this world.

As we dropped closer I began to pick out some thin lines of buildings forming small white arcs around a large bay. There were other forms that appeared to be clusters of construction equipment. A wide swath of jungle had been cleared, but huge blocky patches looked barren.

The docking facility was large and impressive—clearly designed for heavy traffic. But as we settled onto one of the pads I saw that the big complex was mostly empty. Only one small launch was being readied, perhaps a kilometer away.

I was met at the pad by a Carnosite in an open-air coach. He said his name

was Nas Becozi—a man Friday type, I gathered—he would drive me to Nairam for the “negotiations,” he said.

We glided along just above treetop level with this guy providing a rapid-fire string of chatter about the resort construction. “Ten thousand rooms in each complex, sir,” he was saying, “with special facilities designed for Muldivian guests, of course. Boron-filament construction throughout, of course. The subassemblies imported from epsilon-Eridani, of course...”

I could see activity below us: levi-field cranes swinging girders into place in the ribcage assemblies. And some construction tugs were hovering in the air above. But my attention was captured more by the broad arc of the bay itself: a surf of rolling pink foam and a wide beach of powder blue sand. Travel poster stuff, but nonetheless impressive in reality. I noticed a scattering of sunbathers and a few figures bobbing in the waves.

“This will be the principal resort on Agah,” my guide was saying. “There are two others in the southern hemisphere about half this size. We expect them to take the overflow of tourists. And then, of course, there is our sister world, Nariz. All the resorts there will be about this size....” He noticed that my attention was on the small knot of bathers, diminished now by distance. “The war, of course, has slowed our expected growth, but we are confident that now that the political situation has settled down, soon guests will be arriving in droves....”

It *was* beautiful, I had to admit. What bothered me was that one man owned it all. Ons Nairam had bought the tides and the soft blue beaches. He owned the streaming sunlight and the cool salt spray.

And he sat in a wicker chair.

“I represent Fermi Industries,” I said unnecessarily, as I sat down across a small glass table from him. Carnosites do not shake hands.

“Mr. Maygan, this House of your kin, this Fermi Industries, has turned its back on our friendship. I welcome you, certainly, as my personal guest....” And his portly face broadened into a half-smile. “But as to doing business...”

There is nothing obviously feline about the Carnosi, except, perhaps, the eyes, but sitting there on the veranda of that manor house, Ons Nairam looked for all the world like a tomcat on a sunny windowsill.

“Mr. Nairam,” I began, “certainly you know that the recent war in the Orion Sector has made it impossible for our firm to send a representative to meet with you until now. I can assure you that Fermi Industries wishes for the most cordial relations....”

“I have dealt with many tradesmen in my years,” he said, selecting a morsel of cut fruit from a bowl on the table. “Always in these matters they have found a way. Our overtures have gone unheeded for these six standard months now, our power needs ignored.” He studied the glistening fruit in his fingers. “Have you been sent here as an afterthought, perhaps, Mr. Maygan? Is it possible that this great House of Fermi has only now deemed it worth their while to send an emissary?” A feigned hurt wrinkled the rotund features.

This character was a pro, I realized—a master dealer and a self-made man.

“Mr. Nairam, I’m sure you know that travel has been restricted in this sector....”

He popped the fruit in his mouth and looked away. *I am being lied to*, the alien face was saying. “... and it has been only after great personal travail that I sit with you here now...” I managed to look hurt in return. I could see he liked that—I was playing the game.

He nodded, chewing methodically, still looking away. "I am sympathetic, Mr. Maygan. These remain perilous times... and, as one abused and suffering creature to another, I would be naturally inclined to deal with you, but, you see, the prolonged silence from your masters has driven me into negotiations with a rival House...."

"Einstein Engines..."

"I am not at liberty to say. I'm sure you un derstand."

I licked my lips and tasted sweat. It had been too long since I'd engaged in anything like this. "Fermi Industries," I said, lying, "has empowered me to offer you a special discount rate for an exclusive contract to provide power for this system." No response. "Thirty-five Gigs for the whole package." Something in the eyes, but he quickly caught himself.

"You are, of course, joking, Mr. Maygan," the alien said. "Or you are a fool. Or, perhaps, you think *I* am a fool." With a flick of his hand, he dismissed me like an annoying insect.

I sat forward and tried my best to look sincerely shocked by his rejection. "You must understand, Mr. Nairam, that the Hazinrih System is scores of parsecs from our nearest manufacturing centers. Transportation costs are largest part of that figure...."

"In a very short time there will be hundreds of regularly scheduled starliners streaming here from all the centers of the galaxy." He spoke wearily, as if reiterating the obvious for a particularly slow child.

I bit my lip, the wheels turning. "Please excuse what I am about to say, Mr. Nairam, but there is a reality here that must be faced...." He half-turned and arched a furry brow. "The banks, Mr. Nairam—they are a cold and heartless force that *all* our Houses must face every day. You must understand that because this system has no history of off-world trade—none to speak of, in their terms—there remains the question of default and bankruptcy if your anticipated tourist trade does not develop." It was risky. Part of the slight tremor in my voice was for real.

"And there may be no sunrise tomorrow," Ons Nairam said without a blink. "You have seen some of this world. And Nariz is even more beautiful. Mr. Maygan, you are toying with me." He spread his pudgy gray palms and looked down into them sadly. "I am a simple man with a simple dream. But even simple men have limits to their patience." He looked at me with righteous indignation. "We have a saying on Carnosi: The first time a man teases the bushmouse, he loses his pride; the second time he loses his fingers."

I could feel the adrenaline pumping now, just like in the old days. The parry and thrust with a smart client over a big deal. And this guy was good. But he'd lost his big edge—it was obvious that that business about negotiating with a rival firm was bull-muck. I had thought as much, but now I was sure.

"And we Earthmen, too, have a saying: Look before you leap. We *have* looked—at credit references. It does us no honor to do this, I know, but it does make for good business." I was lying through my teeth, of course; communications from the home office over this deal were sketchy at best, but I was gambling that Nairam had overextended himself with the construction I'd seen.

He sucked in a breath and let it out in a sigh. He stared at me then for a long moment. "I sense in you a basic kindness that has not been poisoned by your masters. I will bare my neck to you, Mr. Maygan, against all natural caution, in the belief that you could not harm a helpless old man." The cat eyes dropped, as

Nairam examined his fingernails. "But as to that matter of"—a small laugh—"thirty-five Gigs. Why surely that was an opening ploy to screen us here for gullibility...."

The bell had just rung for round two. I bit my lip to keep from smiling. "I assure you, Mr. Nairam, that that figure was written in the blood and sweat of the House of Fermi...."

He reached over and picked up the carved wooden bowl, and damned if he didn't look like a grinning tomcat. "A piece of fruit, Mr. Maygan?"

We closed the deal at thirty and a half.

Nairam had an ice-water-soaked towel draped over his shoulders, and I was stubbing out my third stogie.

"You will be my guest, of course," he said a little weakly, "for a week on Panka."

"The third planet? I thought it was undeveloped."

"Undeveloped?" Nairam lifted one edge of the towel and held it against his brow. "That is most amusing, Mr. Maygan. I see that your research of the Hazinrih System has not been very penetrating." He managed a thin smile. "An unknown weakness. Perhaps I should have held out for that other figure a bit longer."

My eyes moved to the signed contract on the table.

"A joke," he said, the full Cheshire smile returning. "Panka is... most interesting. I'm sure you will find it so."

I had time to shower and send a terse message to the home office on the room's transponder. I could tell they were delighted with the deal, even though the response was matter-of-fact. Somebody back there was smart enough to know that Nairam probably had the line tapped. They *did* say the district manager's office would be waiting for me when I made it home.

I was going home.

But first, the formality of Nairam's hospitality—something I could quite easily do without, but a necessary coda to the negotiations.

The next day the world that swam up on the cabin screen of Nairam's launch was strange indeed: a green and blue patchwork of heavily forested landmasses and landlocked seas. The colored areas meshed like puzzle pieces—the effect only broken here and there by wispy cloud formations.

Nairam chose to remain mysterious about Panka, except to explain that we'd be staying at a villa that he maintained for his private use on one of the southern landforms. The rest of my questions he evaded with a feline twinkle. He didn't want to taint my first-hand impressions, he said.

We were coming in on an old-style shallow angle trajectory when I began to resolve a network of fine silvery lines on the screen.

"Those can't be rivers," I said, pointing at the brocaded lacework. "A canal system?"

Nairam only grinned as his pilot brought us around for a landing. The small pad was tucked into one corner of a narrow valley. Rolling hills, heavily wooded with purpletrunked trees, surrounded us on all sides. Hazinrih's dim sun at this distance was strangely muted, creating an eerie light quality.

Nairam's villa—a multitiered arabesque structure in white and lavender—was near enough for our landing to have rattled its window panels. As we approached the place on foot, I noticed that the trees on the encroaching hill

seemed to have grown in a sinuous pattern, like a frozen ocean wave of purpletinted green. The wild grass underfoot grew in whorl-like clumps that meshed and clashed with each other like a network of gears.

I was taken through labyrinthine halls to a guest room that might have suited a Middle Eastern sultan or a Muldivian giosk. An hour later, I found my way to a main dining room where Nairam was waiting at the head of a sumptuously spread table.

It was Carnosite fare that I'd never developed a taste for, but it was well prepared and, as they say, nutritionally compatible. Throughout the meal Nairam talked at length about his vision of a tourist mecca for Agah and Nariz. There was enough ego tied up there not to warrant interruption, so I let him ramble on until he began to run out of steam.

"And this world, Mr. Nairam," I put in at last, "what plans do you have for Panka?"

"Ah, Panka may one day surpass Agah and Nariz as an investment property." He swirled a goblet and sniffed at it with a coy smile. "It will be a matter of finding the most appropriate way to exploit its potential. You see, this world offers some unique recreations. Quite unique, I would say. Already I've managed to turn a small profit from a very select clientele." He sipped and watched me over the rim. "But I can see that your curiosity is getting the better of you. There will be enough time to give you a short tour before dark. That is, if you are not too tired..."

I was tired. And I wanted to go home in the worst way now. But there was something about this place that was making my skin crawl—for no rational reason.

"No, I'm not tired," I said. "I'm really quite anxious to see what Panka is all about."

We were cruising at high speed and low enough that the top branches of those strange trees swayed and danced in our wake of air. Nairam was at the controls of the bubbletopped coach, but about half the time, his attention was caught by some detail of the landscape.

"Deer," he said, pointing. "Something like your Earth deer. A new herd... amazing!"

I didn't see the deer, and I couldn't fathom what was so amazing, but my breath caught in my chest as he pointed, and the coach dropped five meters, our field sending up a shower of leaves and splinters.

Nairam seemed oblivious to my moment of panic. "Every year at this time you see entirely new species foraging in the mountains. Last year they were similar to the namack on Carnosi. Did you see them?"

I shook my head numbly. "I missed it."

"Once it was an antlered herd with magnificent golden spikes. They rubbed them on the tree trunks, but we were never able to decipher the markings...."

"Decipher?"

"Yes, I'm quite serious. It was a hieroglyph pattern on many of the trees." Nairam tweaked one of his fingertip controls, and the coach banked and climbed, narrowly missing a rocky overhang. "Perhaps, the best place to begin is Lake Nacha—it's the source of those rivulet networks you were admiring during our descent in the launch."

Five minutes later, we soared up over a mountain crest, and a huge silvery

expanse spread out beneath us. The lake was shaped like a circular starburst, each of the many spicules around the perimeter formed a sinuous channel that soon lost itself among the trees. "It's named after one of my daughters," Nairam was saying. "It's quite beautiful, don't you agree?"

I nodded, open-mouthed, watching those dozens of silvery threads glinting at us from out of the forests. "Surely that's not a natural lake," I said.

"Those streams run for hundreds of miles. Some of the channels are as straight as an arrow's shaft, but most meander in some analyzable way." Nairam yawned and rubbed his cat eyes, the coach dropping until he flicked a control. "I wouldn't know about such things, of course, but my engineers tell me that each of those rivulet courses can be plotted from a trigonometric equation with very few terms."

"Trigonometric equation?"

Nairam was admiring the view. "Like the spokes of a magnificent wheel, don't you think, Mr. Maygan? And this lake is but one of twelve like it."

The dim Hazinrih sun treaded water on the lake surface below us. "Who built this world?" I asked at last.

"Why, the gods, of course," Nairam said with a smile.

"If we do not tarry excessively here we will just have time to return to the villa before dark." Nairam slid the wing-door of the coach closed and motioned me toward a thicket of lush vegetation.

My head was still swimming with the sights I'd seen on our hour-long flight: wind-carved mesas whose shape suggested living forms; hot springs and geysers blowing water and steam in playful patterns like a Cellini fountain. A mud hole spouting perfect smoke rings three meters across. Bird-like animals nesting in seams of gold on a granite cliff face, preening themselves before the golden mirrors.

"This way, Mr. Maygan," Nairam called, looking over his shoulder. We were walking in a humid rainforest, and I had veered off the overgrown path. The terrain was dense with broad-leaved ground plants, most of them mottled with speckles of dazzling color. Towering palm-like growths formed a dark canopy overhead. Vines twisted up the leathery trunks, and ferns nested everywhere.

"Through here. It's only a short distance." Nairam had reduced his voice to a husky whisper and led on, mopping his brow with a pocket cloth.

It struck me as the kind of place where it wouldn't take much to become hopelessly lost, so I hustled to stay close. Some brilliant yellow furry things hopped by through the undergrowth, otherwise I'd seen no animal life. And the place was eerily silent—just some leafy rustling from the canopy overhead, and the sound of our own footfalls.

Minutes later, Nairam stopped. "There, do you see?" He motioned me to stand beside him, holding down a large heart-shaped leaf that blocked our view.

It was a clearing with an assembly of grass huts. Violet-skinned humanoids were scattered about, engaged in a variety of tasks. Thin and lithe, they moved with the grace of dancers. They were naked except for garlands and wristbands of white flowers. Even from this distance I noticed that their eyes were terribly blue.

"I didn't know that this world was populated," I said in a whisper.

Nairam raised a hand to his lips to silence me. Something was about to happen.

Seconds ticked by as we stood in the humid dark.

A male who had been forming pots from coils of dark clay responded to something I couldn't see. He abandoned his work and prostrated himself on the ground, his lavender arms extended. Others, I noticed, were doing the same.

I looked at Nairam, but he ignored me, intent on the village. It was a scene of prostrate forms now, all the simple preoccupations abandoned.

And then I saw something more startling than any of Panka's other strange visions. Barclimas Tragg was standing in the opening of one of the grass huts. The reclining bodies, the outstretched arms were all directed towards him. Bare chested and deeply tanned, his hair was shoulder-length now, and he still looked thin and gaunt. He stood with his hands on his hips and his chin held high.

I reacted with a sudden indrawn breath and staggered backward, almost toppling into the undergrowth.

The noise must have revealed our presence—there was a stir among the reclining natives. I noticed the potter turn, and I seemed to meet his eyes, which were all iris and the deepest ice-blue.

Something changed on Tragg's face, his eyes darting toward us, then back and forth among the natives. I saw no sign that he identified me, concealed as we were in the forest darkness. He stepped out of the opening and began to walk slowly among the prone bodies, hands knotted behind his back. In all that followed, he never looked again in our direction. Now he walked with feigned casualness, as if he were examining the prostrate natives like flowerbeds on a stroll through a garden.

Tragg stopped alongside the male who had turned, and whose head was still cocked awkwardly toward us. "Do you see something interesting back there, number eight?" His voice had a mock-cheerful tone, laced with madness.

The male's head turned to follow him as Tragg paced around this offending weed. "This is not your first offense, number eight. You have been a sorrow to me...." The lavender body began to tremble.

"Look at that," Nairam whispered. "Marvelous!"

I looked at him in disgust, but he didn't notice. "I know that man," I said.

Nairam turned then and looked at me with a question in those cat eyes.

"I forgave you when you stole the fruit from twenty-seven," Tragg was saying. "I forgave you when you made that strange face when my shadow fell upon you. I even forgave that illicit night you spent with number seventeen when it was not her time...." Tragg's voice suddenly rose in anger: "*Did you think that god did not see you!*"

The native was in a palsy of fear and issuing faint sounds like a whimpering animal.

"How should you be punished, number eight?" Tragg said, resuming the mock-cheerful tone. "Should I lift you above the trees and pull you apart so that you rain upon our houses and your blood paints our roofs?"

The native's arms and legs were thrashing wildly now, and he was moaning and choking with sobs.

"Mercy, Lord!" one of the other prostrate natives said.

"Or should I extinguish your life with a single thought?"

The cry for mercy was picked up by two more. And then it multiplied. In seconds, the air was resonating with the cry in unison from the prone bodies: "*Mercy, Lord!*"

Tragg was still looking down at the quivering native. I had to strain my hearing, but I caught his words over the tumult: "These good people pray for your life, number eight, but it is past prayer now. I will be swift for their sake.... You are gone."

The male stopped shaking and lay motionless. The wails for mercy faded quickly into silence.

Tragg looked up and began to walk again among the prone natives. "The wages of sin, my people. Learn this lesson well."

Number eight got up slowly and awkwardly, all grace from his movements gone. I noticed that his skin color had paled and his eyes were now a clouded blue. He walked through the village clearing, stoop-shouldered, weaving through the reclining natives in a direction opposite from Tragg. Finally, he disappeared into the forest.

"How much did he pay you?" I asked, staring out the coach bubble at the racing sunset reflected in Lake Nacha.

"I do not believe the exact figure is important," Nairam said, examining his nails in the dim glow of the instrument panel. "At any rate, it is privileged information. I will tell you it is not cheap."

"And Panka..." I waved a hand at the lake and mountains, "the whole world is an alien artifact."

"Well, technically it would be considered an engineered world. The surface has been reworked on a massive scale, of course. But it was the bioengineered gene pool that frightened that Arab sect out of this system."

Nairam tweaked a stud, and the coach climbed sickeningly, but I was beyond reacting. "Those natives back there were not intelligent life forms then?"

"No more than those hieroglyphic deer I spoke of before. The genetic reservoir here is very deep. It has been encoded with all sorts of odd default parameters. The system tunes up, so to speak, from outside influences—tissue traces, flecks of dried skin that contain genetic information, and even electromagnetic neural patterns. The Arabs, and then our work crews, were probably responsible for evoking the bipedal upright forms. The life cycle here is really quite ephemeral. The fine detailing—physiological details and the behavioral patterns—will set up with only a few months of close contact with the... client. We call that the empathic conditioning phase. We managed to get Mr. Tragg back there settled quite expediently. The psychodrama, as you might call it, should remain stable indefinitely."

"And you don't know who built this place?"

Nairam shook his pudgy jowls. "A very powerful and very strange race, no doubt. 'Why?' is, perhaps a better question. And one could also ask why it was abandoned hundreds of millennia ago. For that, I believe I have an answer."

I looked at him expectantly.

"I believe they outgrew it," he said.

I'm adjusting to Earth-side life. The old desk job grows on you. I still think about the Great Circle from time to time, but I don't really miss it. My roots are growing at last.

I still take a few customers out to lunch when a home sector salesman brings one through the office. And occasionally I'll make a real-time

transponder call to help close some deal off in the wild black yonder. But most of it is budgets and file shuffling, and lots of boring sales meetings.

I've taken up oil painting and the autolyre. And I think I'd like to marry if I can find someone who'll have me. If that comes to pass, I think I'd like to buy a small farm. There's still lots of country here if you know where to look.

I haven't forgotten about Barclimas Tragg, though. I'm writing letters to regulatory agencies to try to close down Nairam's fantasy world and get some help for Tragg. And maybe others like him.

As it turned out, Tragg was looking to buy, not sell, all along. Whether the sick dream that he bought represented heaven or hell to him, I don't think even he could say.

The thing that troubled me at first was the thought that we, as a race, are still capable of producing individuals so devoid of love. And then I came to realize that no one has ever been born in the state of mind in which Tragg found himself. Collectively, the rest of us failed him, failed to touch him.

Another missed sale.

God help us if there are too many more.

The Perfect Bracket

Howard Hendrix and Art Holcomb | 5498 words

Mann's attention shifted from one Big Dance to the other—from the last game of the Final Four on his smartphone screen to the dance of the tall, lighted fountains in the lake out front, through the high Bellagio windows. His wife Cheryl called the blocks-long water feature out front the “fake lake,” but Mann had always liked the Bellagio. He didn't like how the Big Dance on the small screen was ending, though. Not at all.

The scene on the small screen switched from the waning moments of the game on the other side of the country, to John Peoples here in Vegas, in a ballroom of this very hotel. Dressed in work shirt, jacket, slacks, and no tie, Peoples seemed an average, sincere, lucky bastard—and his unbelievable luck was holding.

The last thirty seconds stood on the clock through another time out, but it didn't matter. Xavier University of Cincinnati, Ohio, had a commanding lead. Shortly that team would be crowned NCAA basketball champs, its Cinderella story complete. John People's last prediction, number 64, would come true. He would succeed where so many millions—including Mann himself—had failed.

Despite the increasing offers to buy his bracket out (and the swarm of betting surrounding whether or not he would accept those offers), Peoples had stuck to his bracket all the way through. He had done the impossible, accurately predicting every win and loss of March Madness. His perfect bracket would shortly be worth a billion dollars, though he had already opted to take the money in a single lump-sum payment of five hundred million dollars.

It was all over but the shouting, and soon the shouting began. Mann cursed under his breath. Lucky bastard? Hell no. Bastard luck—in the old sense of “illegitimate.” There was just no way any human being could have done what Peoples claimed to have done. Not without some scheme, some cheat. Had to be.

In the dim reflection of the tall window, Richard Mann smoothed his hair and suit coat, adjusted his tie, and looked down at his smartphone. He would have preferred an augmented reality heads-up rig, but casino security was very touchy about such fancy glasses. Turning from the fountains, he made his way toward the ballroom where, according to the feed on his phone, the award ceremony had just begun.

Mann recognized the emcee as a big honcho with the hotel and casino—a dapper executive type, grey at the temples. As he made his way up from the lakefront, Mann realized the emcee, already well into his spiel, was talking about the history of the Billion Dollar Bracket Challenge. How it began with Buffett and Berkshire but, in the intervening years, had passed through enough sponsors' hands that it had become something of a free-standing franchise. People had taken to calling this year's version the Bellagio Bracket, though the emcee demurred that his resort was just one of many sponsors.

Mann detoured slightly on his way, so that he passed by the bar where the fan after-party was beginning. He and Cheryl and two other investigators had pooled their money to pay for the Billion Dollar Bracket Losers' Party. As he passed the bar, Mann reckoned there must be close to forty people drinking on his tab already—and counting. They'd gotten no fewer than sixty messages from those planning to “definitely attend” the party. The flash-mob publicity seemed to be working.

The roar that greeted Mann when he came to the open doors of the media-packed ballroom wasn't for him. It was for the big winner, who had just bounded up on stage. Shaking the man's hand, the emcee handed him an oversized cardboard check. It was made out to "John Peoples" for "\$500,000,000.00" and signed with the emcee's own giant John Hancock.

As the emcee and Peoples reprised their handshake for the cameras, reporters shouted rapid-fire questions. Peoples answered a smattering of them—humbly, but evasively, Mann thought. Finding the air in the ballroom stifling, Mann stayed just long enough to catch the eye of his wife, playing reporter for the Razzi Channel. He gave her a small nod, which she returned.

The ball's in her court now, Mann thought. He linked to her live Razzi feed and followed her as her head-cam recorded her every unedited move. Watching, he saw Peoples depart through a side door. Mann was jostled with Cheryl as she jostled her way through the pack of media hounds following close on Peoples' heels. Cheryl soon managed to make it into the lead. Good girl, Mann thought. That college lacrosse scholarship and her years of body-checking opponents was paying unanticipated dividends.

The minders around Peoples stopped the wave of paparazzi before Peoples reached his room, still carrying his giant check.

"Just one more question, Mister Peoples!" Cheryl called.

"Okay," Peoples said, sounding weary. "One more, but then I do have to go. What's your question?"

"What are you going to do with that lumpsum payment of five hundred million dollars? You've never actually said."

"I honestly haven't given it much thought. All the media publicity, the interviews—the whole thing is kinda overwhelming. I mean, this is the first time I've ever even been to Vegas. Now, if you don't mind, it's been a day."

"Okay! Thanks! Good Luck!" called three different reporters, all at the same time.

"How much luckier could I be?" Peoples said, flashing a grand smile before he turned away.

On the Razzi feed, Mann saw that Cheryl was lingering near one of the minders, making small talk. If all was going according to plan, though, Mann knew Cheryl was actually trying to stay close enough to Peoples to suss out his room number. The hotel was keeping that location secret even from its own security.

A moment later, Cheryl bid farewell to the minder and walked away. She shut off her Razzi feed. Mann's phone sounded its ringtone—five musical notes, which in an old science fiction movie had signified alien contact.

"Yes?"

"Room 211, honey. I'm sure of it."

"Great job, girl. Have Griffith tap into the surveillance for that room and cut out a cover loop to replace the closed-circuit feed. I'll take it from here. Oh, and you might want to hang out at the losers' party for a while. Make sure none of them go thirsty."

"Will do."

They signed off. Avoiding the elevators, Mann opened the door to the nearest stairwell and began climbing. He had only gone a step or two when he got the live feed of Peoples' room, from Griffith, the team's inside man. Mann watched as Peoples ushered his minders and guards out of the room, then closed

the door behind them, relieved. Peoples took one more look at the giant check and gleefully tossed it on the bed. Mann watched as Peoples unfolded a suitcase stand at the end of the bed and started packing.

After a few moments, though, Mann noticed that Peoples seemed to be packing the same suitcase again and again. The cover loop was in place. He hoped no one in hotel security tumbled to it.

Mann stepped onto the landing for the second floor, switching his smartphone to room monitor mode as he did so. He placed the phone in one of his jacket pockets, and pulled the NCAA investigator credentials from another. They looked impeccable. Time to do the ol' dumb gumshoe.

He approached the odd couple of bodyguard and minder outside 211, presented his credentials, and asked to be allowed admittance to Peoples' room. The bodyguard looked over Mann's documents to make sure all was in order, then handed them to the minder, who did the same. After a moment they nodded. The bodyguard knocked on the door. After Peoples opened it, the guard stood aside.

"John Peoples?"

"Yes?"

"Hello, Mister Peoples. I'm Richard Mann, an investigator with the NCAA. Congratulations on your incredible good fortune!"

"Thanks!"

"Just a couple more questions."

Peoples sighed.

"Come in, I guess. I was just packing. Close the door behind you and have a seat."

"Thank you. I was wondering..."

"Yes?"

"Well, actually we were wondering. Just how did you really come up with the bracket? I know what you said in interviews and at the press conference, but..."

"And?"

"Let's just revisit the odds involved here for a moment, Mister Peoples. These Vegas book makers—who make a living at this, and quite a good one—say that the odds of filling out an absolutely perfect March Madness college basketball bracket are... 9.2 quintillion to one!"

"I've heard that. Amazing, right? I've also heard it's 'only' one in 128 billion, if you have solid knowledge of basketball, and understand how the brackets work."

"The Patterson odds projection. Right. Mind if we talk about that for a moment, Mister Peoples?"

Peoples pulled up a chair and sat down.

"Okay, if that's what's on your mind."

"Nine point two quintillion to one," Mann said. "Or at best about 128 billion to one. Odds somewhere between impossible and slightly better than your house getting destroyed by a giant rock from space. That's according to Dr. Nathan Patterson of MIT, the world's leading authority on odds and probability."

"I know his work, and his credentials."

"Me too. When I spoke to Patterson a few weeks back, he told me the odds of winning the Powerball lottery are about 175 million to one. So, even at his *lower*

figure for the odds of picking a perfect bracket, that's still about—what? One thousand times more unlikely than winning the Powerball?"

"Hard to imagine."

"Isn't it though?"

"I know. I know. Crazy."

"Patterson actually said—and this is the part I found so fascinating, Mister Peoples—he said that picking the perfect bracket was so highly unlikely that it was, in essence, humanly *impossible*."

"I know. I know... Wait, what? What are you trying to say?"

"Although the full pick is *statistically* possible, it is, in fact, not really possible for a living person to predict the correct outcome of 64 college basketball games in bracket form. Not for five hundred million lump-sum, or a billion bucks over the rest of your lifetime. Or a trillion. Or a quintillion. Impossible."

"Well, not impossible. I did it."

"Yes, you did, Mister Peoples. I think maybe you know where I'm going with this."

"No, I'm afraid I don't."

"What I'm saying is that no person without prior knowledge of the outcome of those 64 games could have created a perfect bracket."

"But that's not true. *I* did it."

"So it seems. And that's why I'm here."

"What? You think I cheated? How would it be possible to cheat at such a thing? I'm just a fan. I detail cars for a living. I just... got lucky. Really, really lucky."

Peoples gave him a winning smile. Mann was not won over.

"That's where the problem really lies, for me, Mister Peoples. I thought about this long and hard, ever since I first heard the news of your build toward the perfect bracket. Luck really cannot come into this matter—couldn't really ever be a factor in something that's practically impossible to do in the first place."

"But isn't what you're saying one of those logical contradictions? It can't be impossible to do if I actually did it. I was with a group of guys doing it together. They watched me as every game was played. They watched as each of their brackets turned to shit, but I kept winning. I kept waiting for the whole thing to fall apart but... it never did. I won. I was right."

"I don't think that you listened carefully enough to the first statement I made in this little exchange, Mister Peoples. I said that no person *without prior knowledge* of the outcome of those 64 games could have predicted a perfect bracket."

"What 'prior knowledge'? How can anyone have prior knowledge of a thing that plays out in real time, after the prediction is made? My bracket was filled out by the deadline, before the first game. I followed all the rules—and there were lots of them. How could there ever have been prior knowledge?"

Mann slowly stood. He reached behind him and pulled from his back pockets two innocuous-looking plastic pieces that, when clicked together, made a small gun with a very obvious silencer. He pointed it at Peoples.

"There's the rub. Maybe now you start to see what I'm getting at."

"What the hell are you doing?"

"Oh, the gun? Well, that comes into play later, as you must already know."

"What are you talking about?"

"This problem you presented... it made me crazy. I couldn't work. I couldn't sleep. It kept me up for a long time, Mister Peoples. How could someone do something impossible—or 'highly improbable,' if you prefer? I just kept rolling the idea over and over in my mind. How could you have done a thing no person could reasonably do? I finally had to accept the fact that what you did was, in fact, not an impossible thing to do at all."

"Right. It was possible to do because I did it. You see the point I'm trying to make, Mister Mann? It's kind of a tautology—the blue sky is blue because it isn't some other color. Could we put the gun away now?"

"I did see the point, yes. Finally. But I had to expand the way that I thought about the problem. What you did had to be possible somehow—had to be, because it *happened*. But that would mean that it must be possible through an agency that I *believed* must itself be impossible. Some agency or method I believed was more impossible than your actually winning the entire bracket, at the amazing odds of 9.2 quintillion to one."

Peoples sat back in his chair and folded his arms.

"What 'agency'?"

"I had to admit to myself that something I thought was more impossible than building a perfect bracket had actually taken place. And I finally thought of that something. So, to verify my theory, I asked the professor and these Vegas guys to show me a list of things that were more impossible than 9.2 quintillion to one."

"What did they say?"

"They told me that there wasn't anything they could think of, offhand, that was more unlikely than that. See, it isn't just picking 64 winners, as I'm sure you know. It's not just a matter of which team would win in each slot, out of the 128 teams that made the playoff. It was also all of the teams that were actually eligible for the playoff in the first place. The whole history."

Peoples flashed his eyes in a way Mann couldn't help but think of as *shifty*.

"I think I see what you're saying, Mister Mann. But that can't be right. Is a perfect bracket more impossible than, say, a tomato spontaneously turning into a suspension bridge? Or the Mississippi suddenly running rich with strawberry jam? Those have to be much more unlikely."

Mann pondered it a moment, but did not lower his gun.

"But those would be Acts of God, not the actions of a man. You actually *did* this. So, if this was the most impossible thing ever done in history—I mean done, by a human being, up to this place and time—how could it have been accomplished?"

"By luck, Mann! Just blind, do-dah luck."

Mann took more careful aim with his gun.

"Sir, if you say that again, I will shoot you straight through the brain. And I'm tempted. Brains that can't be wrong just ain't right."

"Sorry."

"The same goes for calling the police, or your bodyguards, by the way. We're going to get to the bottom of this, just you and me. So... night after night I thought about all this, like I said. I mean, it's not as if I could spend years considering the matter. My time was limited. You were going to get the money once the bracket matched your prediction. But I believe I hit upon the answer I was looking for. That highly improbable agency."

"Good. Finally. What's the answer?"

Mann paused a moment, taking a big inhale.

"Time travel."

"Time travel?"

"Yeah. Time travel. It's the only thing that makes any sense. It's so simple I could have kicked myself."

"That's what you really think? I'm a time traveler?"

"Yup. It was in front of me all the time. The offer of a billion bucks for perfectly predicting the full March Madness bracket—that had to be an irresistible honey-trap, especially for a time traveler in need of dough on the go!"

"What makes you think that, Mister Mann?"

"Because only a time traveler—from the future—could come back to 'predict' what would happen. Because, for him, it had already happened. It was already part of *his* story. I figured if any time travelers existed out there, one of them would come across this contest in the past and would sooner or later get greedy. That time traveler turned out to be you."

Peoples abruptly laughed.

"That'd be a fascinating idea, if it weren't crazy."

Mann moved a step closer, his grip on the gun tightening.

"Claiming you won by luck is not only crazy—it's impossible, and insulting. Remember, 'Once you eliminate the impossible, whatever remains, no matter how improbable, must be the truth.'"

"As Sherlock Holmes once said."

"Bingo. I'll take Sherlock over sheer luck anytime."

"There can be other possible explanations, you know," Peoples said, his expression oddly serene.

"Try me."

"Crowd-sourcing, for instance."

"Already considered that. The whole population of the planet would have to have been filling out bracket forms for millions of years—long before computers even existed to process them. Time travel would still be required. It would take the biggest conspiracy of all time to make that theory work, too. No one could keep that big a secret for very long."

"Just a group of guys, then, like I said."

"Same problems as with crowd-sourcing. There's no evidence you were working with any 'group of guys' on this anyway, Mister P. Too many partners bellying up for a piece of the pie, and you not inclined to share. Believe me, I understand. We're more alike than you know. I usually prefer not to work with anyone besides myself, either."

"Superfast computers, then."

"I checked that too. The best computers we have, with the best speeds, haven't existed nearly long enough to process their way through these odds. And you'd be disqualified for using them anyway, since use of computers for building the bracket isn't allowed by the contest rules. So we're back to time travel. Stop trying to slow-play me, John. I know you took an undergraduate degree in physics, and you were doing graduate work in neuroscience a few years back. I know about the family health-care crisis that forced you to leave that graduate program and take a job for some ready cash. I know about you."

"You seem to have thought quite a lot about this."

"Like I said."

"So, say you caught a time traveler. You brought a gun. Clearly you plan on

using it. But why would you want to kill someone just for being a time traveler?"

"It's not just for being a time traveler! At first this effort was all about the principle of the thing. The boys and I were talking about it. Dammit, it's the perfect *bracket*, not the perfect *racket*! We would absolutely want to make the cheat who rigged the system pay for his unsportsmanlike behavior. We wanted him punished. That's why I joined the bracket investigation team to begin with. But now that I think more about it, I'd really hate to have to kill you. "

"I'm happy to hear it. To what do I owe such sudden mercy?"

"Not sudden. The gun is more to help me blow your cover than to blow holes in you, at least if you're willing to play it that way. You might be worth a lot more to me alive—if I can find your time machine, say. I'd say it all depends on how cooperative you are."

"Wonderful."

"But if you cause me too much trouble, I'll remind myself that even dead you'd have value, if I can use your corpse to prove you are what I say you are."

"But what good would a dead time traveler be, to you?"

"I'm sure there are lots of people in this world who would pay to keep time travelers from screwing up their business models," Mann said, musing. "I could start my own business. Call it Chronological Order Protection Services, maybe."

"C.O.P.S. How quaint. You're clever, Mister Mann, but never quite clever enough." Peoples took dark sunglasses from his shirt pocket, put them on, and raised his voice slightly when he next spoke. "We can come in now, gentlemen."

Instantly three gunmen appeared in the hotel room, as if from out of the nowhere in which they'd been hiding. They were identical to Peoples in every way, except his lack of a gun. The three gunmen drew down on Mann. They had exactly the same gun and silencer model in their hands as the one Mann had in his hands.

Realizing how thoroughly he was caught in their crossfire, Mann reluctantly raised his hands. The unarmed Peoples rose from his chair.

"I'll relieve you of the burden of bearing that firearm, Mister Mann." Mann handed the gun over. "Thank you." Flipping the gun around, he turned Mann's gun on Mann himself.

"Who are these people?"

"They're all me, actually. Come to visit from various universes next door. You've heard of theories about the multiverse, perhaps?"

"Something to do with parallel or alternate timelines?"

"Who's playing stupid now? I know something about your math background, and your gambling obsession too, Mister Mann. I knew we would have to meet, eventually. It's not time-lines we meet along, as I'm sure you know. It's *world-lines*—*some* only logically possible, some only statistically possible, some only humanly possible. That vast ensemble of universes, some subset of which is that rich field of possibilities where quantum computers play. Enormous numbers of superposed states, awaiting the collapse of individual wave functions."

"But quantum computers like that don't exist. Not yet—maybe not ever!"

"I beg to differ. There already exists an electrochemical quantum computer of sufficient complexity for such work. One with 86 billion neurons, each of which can have up to ten thousand synapses, for a grand total of a thousand trillion synapses. The human brain."

"Don't try to hand me that 'we only use 10 percent of our brains' garbage."

"Ah, Richard!" Peoples said, laughing. "May I call you Dick? I know your friends do. No one would call you 'Rich,' certainly. You need to expand the way you think again, Dick. Not that future 'front then' and past 'back then' kind of thing, but everything right here, right now. The ensemble of world-lines is more like a tree than a train track. We're not talking travel along time-lines, Dick. We're talking about computing across enormous numbers of world-lines. That is my talent—my blessing and my curse. I've been developing and augmenting it ever since I left school, but I've only recently begun to use it."

"Impossible."

"That word again, Mister Mann. Why so negative? It's quite humanly possible, since I did do it, as we've both said."

"But how? Some kind of paranormal bullcrap?"

"Not paranormal, although still unprecedented. My talent adheres to the laws of physics in the same way a very sophisticated quantum computer would. Oh, I considered turning my unusual abilities to creating a time machine, I admit, but that seemed so, well, *linear*. Instead, I turned my focus to the study of the multiverse, and made some astounding discoveries."

"Like what? Besides scamming the Bracket, I mean."

"Really, Mister Mann. I prefer not to think of it as scamming the Bracket, so much as gaming the system. And why not, since the system is always already gaming us? You see, with a little proprietary neurochemical enhancement—steroids for the mind, if you like—I am able to tap into my other selves in many billions of world-lines, thereby creating the most massively parallel computer you could imagine. This is the 'group of guys' I worked with. Yes, you were right. I don't like working with anyone besides myself. So I worked with as many of myself as I could find."

"Worked how?"

"Why, we all focused on the problem to gether, of course. Eventually we determined which layout of the bracket perfectly predict ed each outcome, in each of almost innumer able universes. Quantum reality being what it is, maybe we didn't so much predict what *would happen*, as collapse the wave function and *make it happen*. Who knows?"

Mann hoped his phone, on room-monitor mode, was catching all this—and that Griffith would know what to do with that audio.

"So what happens now—to me?"

"You know, Mister Mann, in some alternate universes, I never develop my talent, I never win the Bracket, we never meet. In others we are friends who work together on this project. In still others, I am your unknowing enemy and you shoot me, or you are my unknowing enemy and I shoot you. Along some world lines there is much less unknowing and uncer tainty about who our friends and enemies are. I am always amazed, because I *am* always a maze."

Mann made a noise of disgust.

"You don't feel it, Mister Mann? The wave form of all these superposed possible univers es, waiting to crash on the shore of Now? The emanations of parallel realities, swarming and glowing around our world-line like Hawking radiation around a black hole? It's faint, I know, but I sense it everywhere."

"I'm not on your 'proprietary neurochemicals.'"

"More's the pity. Let's just say everything depends on which branching universe you cut off, and which you encourage to keep growing. Or, in your case, on how much trouble *you* cause *us*, and how cooperative *you* are. Sound

familiar? So, we'll leave it up to you. We await your decision."

"Then you must know you'll never get away with this so long as I'm alive. Never."

"Ah, we very strongly suspected you'd say that. You said something similar in fourteen out of the last twenty-two universes in which we've bothered to play this scenario. Very well. Gentlemen, please show Mister Mann his future."

Despite the greater combined strength of the two men holding his arms, Mann acquitted himself better than he expected, even as they pushed him to a kneeling position on the carpet. Peoples stood before him with what had been Mann's own gun, now pointed at Mann's own head.

"Is this it, Peoples? Does it always end with a bullet?"

"Not always. But maybe this time it ends almost as you predicted—with a shot straight through the brain. Only your brain, instead of mine. That's not the case in every world-line either, though very likely it is, in this one."

Mann found his arms held firmly in place behind him. Alternate outcomes to his situation flickered through his head and were gone.

"So be it. But answer a doomed man one question: If you've already got so much power, what are you going to use the money for?"

"That's what that reporter asked, too. What they *all* ask. Since you won't live to spill the beans, I can finally tell someone. You see, even my newfound power has limitations, Dick. Although in a manner of speaking I can 'communicate' across the ensemble, via my entanglements, the teleportation of macroscale objects is much harder. I can only bring three of my other selves from their world-lines into mine. But with more of them working beside me, who knows what we might be able to accomplish together? We are legion, you know."

"Like devils."

"Not at all, Mister Mann. Having these bracket winnings will simply be good seed money for a research project allowing me to become more acquainted with the rest of me in other universes. I'm still working out the details." Peoples smiled. "That's where the devils are."

Mann struggled and made a moaning sound, but said nothing more that could be coherently understood.

"Looks like I'll be the one moving to the next level in this bracket, Dick. I escape into the cosmos, you vanish into the black hole. Better luck next universe. Good bye."

Peoples nodded to his alter egos. They brought up their guns to fire.

"Wait, wait!" Mann said, sounding as if panic had roused him from his final lethargy. "One final request. Please."

"You already did the 'doomed man' thing, Dick. Too late now."

"Wait! That was a question, not a request."

"Oh, very well," Peoples said, indulging a whim. "What is it?"

"Just let me say goodbye to my wife. What could it hurt?"

Peoples paused, considering.

"How quaint—again! So predictable." He turned to his three other selves. "What the hell? I think we all can be generous at this point, considering what this universe has given us. Some of our other selves thought that specifically predicting highly improbable events actually might make them less likely to occur, but look at us! We've done it!" He turned again to Mann. "Say your goodbyes. Say anything!"

The two who held his arms released them. Mann took his phone out of his

jacket pocket, but Peoples snatched it from him before he could place the call.

"Not so fast. Although there's little anyone can do to stop us, I'd prefer that hotel security and the police not come into this. So I will insist you do not mention our room number here, or the conversation will come to an abrupt end. Your wife's name and number are in your phone's directory, I presume?"

"They are. Scroll to 'Cheryl.'"

"Good. Ah, here it is. I'll place the call. It's ringing. Is this Missus Mann? Your husband would like to speak with you."

Peoples handed the phone over to Mann.

"Hi, Honey. It's me... Yeah, it's all true. No room for error. You guessed right. See you soon."

Mann hung up and gave the phone back to Peoples.

"So brief, Dick? Ah, as woman's love. What was that about?"

"Why don't you run it through your billion scenarios, if you want to find out? I swear, I don't get you, Peoples. I can't figure out if you're some kind of crazy, or some kind of genius."

"Neither, and perhaps a little bit of both. Come now. Your time's up."

"Since you've worked out all the odds in this little scenario, I have one last puzzle for you."

"First a last question, then a last request, now a last puzzle. What'll it be next?" Peoples laughed. "All right, but this is the last of the last. What's the puzzle?"

"Which is the most improbable—the actual order of the bracket, a scheme to predict the actual order of the bracket, or getting away with a scheme to predict the actual order of the bracket?"

Peoples flourished his gun, his patience at an end.

"Stop your delaying, Hamlet!"

"You've got to know that the last one is the most improbable. By predicting it, I've made it less likely to occur—your getting away with it, that is."

From somewhere in the hotel came strange sounds, as of a horde of people yelling, and feet stomping up stairwells. When Mann spoke this time, he smiled.

"What matters now is not the odds for or against time travel, or multiverse computing, or your enhancements, or entanglements, or what have you. What matters now is this: What do you think the odds are of four armed men from different universes getting past sixty bracket-losing, fair-minded, but incredibly drunk and *very* pissed off college basketball fans who, in the casino downstairs, just moments ago realized that the guy who won their one billion dollars—five hundred million, lump-sum—*cheated*?"

The noises of a yelling crowd and myriad marching feet were much closer, now.

"Realized? How?"

"If you check my phone, you'll see it's not actually off. It's in a background mode, one you can use to monitor conversations in a room, for instance. If I were to edit from our conversation, I would choose the part beginning with 'scamming the bracket' and ending with 'collapsing the wave function'—the part where you admit to gaming the system, and then explain how you did it. I think that would be the most incriminating part for the fans to hear, over the TV speakers in the bar, don't you?"

A gunshot sounded from outside in the hallway, but its noise was quickly overwhelmed by the sounds of a human mob once more advancing. Someone—

maybe several someones—pounded on the room’s door. Amid much yelling, the room went dark. Someone had cut the power. Mann didn’t know who had done so, but he could make use of it.

Stumbling over several John Peoples, all of them beside themselves, Mann made his way to the door. He flung it open and stood back, out of the way.

“C’mon in, fans!” he yelled. “They’re all yours!”

Wild gunshots, incompletely silenced, echoed across the room. Soon they too were completely silenced.

Richard Mann, Cheryl Mann, and their fellow “rogue” investigators, Griffith and Bell, would answer many questions in the coming years, but all of that was, in the end, a small price to pay.

Some people (generally not college basketball fans) eventually even believed that Peoples got a bum rap—that he had gamed the system fair and square, found a loophole that the contest’s sponsors and coordinators had not anticipated. To some, Peoples remains more sinned against than sinning, even something of a hero.

Not to Richard Mann. No one would ever call him “Rich,” but it’s enough for him that, in all the years since Peoples got busted for busting the bracket, no one has ever succeeded in predicting the bracket both perfectly *and* honestly. No one has won the billion-dollar bet. Yet many continue to think they might have just enough of the genius of luck, or the luck of genius, to take it all. Knowing the odds, yet still convinced they have a sporting chance, they continue to hope, and to dream, and to try.

And that, thinks Richard Mann, is how it should be.

Elderjoy

Gregory Benford | 1600 words

They had nearly all their clothes off, the fragrant red wine poured, lights dimmed, soft Bach playing—when she said, “Wait, I can’t afford this.”

He shook his head, smiling, and handed her the filmy negligee, kissed her. She had some lines and sags, sure, but the old allure still simmered. One of the unspoken advantages of age was a slow gathering of weight—which, while it made folds, added to a succulent voluptuous gravitas, a ripe flavor that beckoned him. “That new Mindful Monitoring tax? A hundred bucks a go, I hear.”

She frowned with a quirky, lopsided smile, sighed. Then, in the studied, slow-teasing way she had, she slipped on the negligee with a silky elegance. The sliding grace of it brought a glow of anticipation. “Which I can’t afford. Why’s it higher if we’re over seventy anyway?”

He didn’t want the moment to veer into politics, but she had asked, so... “New ruling. NICE—you know, that National Institute for Care Excellence—changed the QUAL.”

She sat down on the bed, eyes narrowing, and tossed some pillows into a useful position. “God, I hate acronyms.”

He toned down the soothing Bach, moved it to the soft background speakers. “That’s the Quality Adjusted Life Year, to gauge the cost of extending a patient’s worthwhile life by a year.”

“*Worthwhile* life? What the hell—”

“That’s us, really. Over the hill but happy, and no disabling conditions. There’s an acronym for it—”

“Don’t tell me.” She gave a low growl and puffed hair from her eyes, her carefully lipsticked mouth in an exasperated twist. “Look, I pay my taxes—”

“This is an extra tax on us old folks, to cover risk of a heart attack. Risk goes up with sex, y’know.” A wink. “Especially when it’s really hot.”

“So *this*—” she pointed to a small nodule at her inner elbow “—will report us?”

“Yep. Mine, too.” He smoothed the sheets back, lit an orange aroma candle. “Our neurocardio monitors see our risk go up, and in a microsec or two, tax charges go on our bills.”

“Damn! That’s what that small type in the contract—*Emergency services are for taxpayers only—means?*”

A shrug. “I think so. Fall way behind, you get no help. It’s an extra service, after all. Kinda like the carpool lane. And the government always needs more money. Congress put this new tax in as part of the deal last year, to reduce student loan rates.” He sat beside her, took her in his arms, managed a chuckle. “So it’s two hundred net for ‘elderjoy,’ as they call it.”

She snorted. “Mindful Monitoring—God, where do they get these names?—has its software listen to my heart go thump-thump. Fine. Right in the middle, our show’s on the road, maybe I get a little tremor or something. So a guy on a motorbike arrives in two minutes.”

This was veering away from the right feeling, but she did have a point. “There are upsides. This all started out to insure our safety, remember? Don’t forget, these new sensors can adjust pacemakers. Send back data on cardio, that blood chem-chip stuff, neuro tags. Even trigger your heart, too, if it has to.”

"Right. More service, everybody wants that. That is, 'til they see it means good ol' Mindful Monitoring needs more cash."

He lay back, vexed, wondering how to get the conversation back on track. Maybe a little humor? "Makes you wonder. Does masturbation count?"

She lay beside him with a small giggle. "It must. Those hormone and neuro-sensors can't tell the difference, can they?"

"Taxed for jerking off! I don't recall that in any Tomorrowland futures."

She ran her hands over his chest, stroking, stroking... then a bit lower. "Save your ammo, sir."

He stared at the ceiling, eyes intent. "How about when you wear that garter belt and hose? It picks up *my* pulse rate. Same charge for everything?"

"I guess so. Is that what you had in mind?"

His face clouded. "Not until now! Damn, this tax is backward. Shouldn't seniors like us get a preference? Like we do at the movies and on the bus?"

"Ummm..." She was plainly out of the mood. He was, too. "Not a bad idea. But then every interest group will lobby for a break. Young people have more sex—Mindful Monitoring has the numbers right there—but kids don't have much income. So should they get a lower rate?"

He laughed ruefully. "The worst off will be the senior, bisexual omnivores, right? They probably get more than anybody."

She snuggled up to him. "But sex is *good* for you!"

"Good, sure. Government taxes goods, y'know."

"And—" a flickering, mischievous smile—"services, sir."

"That's the right idea! Funny, we thought sex was the one pleasure they couldn't find a way to tax..." He held her close, catching the scent of her skin, the rich aroma of her hair. Maybe he should use his old lines? He murmured, lowered his voice into the bass notes. "Guess my favorite number..."

But she sat up, face intent. "I wonder if I can hack into the omni-feed, the one that monitors us?"

He sighed, rolled his eyes. "Ah, you tech types. To do what?"

She looked into the distance, the way she did when she explored an idea. "To disable it, while we make love. Save two hundred bucks."

He laughed. "I dunno. Look at the downside here, though. If you can do that, then it goes both ways. So somebody could hack in, break your code, send an over-stim signal to a pacemaker—"

A flash of alarm in her eyes. "Into my heart monitor and kill me? Gah!"

"Somebody's prob'ly thought of that already. We'll see it in a mystery movie soon."

She stood, pulling off the negligee, face intent. His gathering desire softened. "I hate this! They're eavesdropping on us, that's what this damned Mindful Monitoring really is! We should—that's it!—we should build a room that's a Faraday cage."

"Uh, what's that?"

"A continuous conducting surface, metal, forming a sealed volume. That provides a constant voltage on all sides of the enclosure. Keeps out electromagnetic waves of any kind. Screen rooms, they're called. An English guy, Michael Faraday, invented those in the 1800s. They shield out phones, radar, you name it. Then we can get it on without the tax!"

He stood too, took her in his thick arms.

"Wow, I love you tech types. How do we build one?"

She looked around, smiling. "Metal walls, that's all. I could line this room with sheet aluminum."

He actually thought about it for maybe a second. "Let's try it sometime, sure. Meanwhile..."

She pushed him back onto the bed, reached for her negligee. "I'll pick up the tab today, lover."

It was better than ever. They forgot about Mindful Monitoring entirely.

But soon she was up pacing. She popped out ideas, lingo, plans. Their talk later, calculating costs and methods, got them excited again, with predictable results.

Within a week, she had the walls sealed tight, windows covered with aluminum shades, doors reframed in metal, even air ducts reconfigured. And in the spirit of science, they tested the idea. No charges showed up on their HealthFeed accounts. Mindful Monitoring was blind.

It was the beginning. They incorporated the business and advertised, at first slyly, online. It was a nudge-nudge, wink-wink overture. SexScreen got orders for service teams by the hundreds per hour, then by the minute. It took all their time to just train their delivery teams.

Dating sites drove the profitability over the breakeven line within two weeks. Orders poured in. They hired teams in North America and Europe that could erect a Faraday screen in a few hours, anywhere the customer wanted, on call twenty-four/seven. Business lifted off like a Saturn V into a clear sky.

"Screeners" became the new buzzword for the hip, though aging, technorati. When done, just raise the aluminum window shade and health benefits returned. Also, cell phone service.

As a team, they appeared on talk shows. They worked up some double-entendre jokes that made their way onto click-bait online sites, providing free advertising. The *New York Times* did a profile, for which they dressed in appropriate business attire, then saucy hip; the *Times* used both. Of course.

The government found no way to detect this electromagnetic deception. The in-body systems did not report continuously to SmartCity systems, so Mindful Monitoring simply registered silence. Fees coming from sex could not be levied on their HealthFeed accounts. This was not tax evasion, since fees are not taxes. Selling Faraday cages was not illegal. Politicians, not fond of laws they could not write—or even better, rewrite—found that electromagnetism allowed no work-arounds, no matter how many hackers they hired.

Market share boomed. The hip blowoff line was: "*Go 'Faraday' yourself!*"

HealthFeed income fell. Mindful Monitoring was in trouble. Tax collectors worried. Pundits predicted dire straits. Senators held hearings. There seemed no easy way to prevent free sex, beyond the ostensibly benign bureaucrat eyes. Some media mouths were predictably outraged.

After elderjoy became regarded as a civil right—*no eyes on me!*—moods shifted. The American Association of Retired Persons came out in favor of Faraday. The entire program of HealthFeed tax collection came to resemble the War on Drugs, a dumb idea that had finally disappeared years before. But this time there were no narcs to inform on old folks getting it on.

The happy couple became rich, too, which seemed to make them ever more horny. (Money does that, research showed.) They spent their final decades in an orbital hotel, where they enjoyed swimming in the zero-g spherical water pools—ideal for making love, rumor had it (soon enough, videos, too). Plus, they

needed no Faraday.

The romantic comedy based on their lives won an Oscar. They appeared onstage to accept the plaudits of the crowd, clad in their new, specially made, all-metal Faraday clothing. It was a shining moment, quite private.

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Snowbird

Joe M. McDermott | 5861 words



Illustrated by Joel Iskowitz

Illustrated by Joel Iskowitz

I never really considered the snowbirds, and what happens when they die, until I saw one of their solar-powered RVs in the parking lot of a hospital. Of course, they would die somewhere on the road, in a strange hospital, and everyone who wished to see them would have to find a way to reach them in Saratoga Springs or Denver or Florida or wherever they would happen to have gone, chasing their endless summer day. They travel in solitary migration from Patagonia to Ottawa, always moving, never spending the week in the same place, gathering energy during the day to power their batteries, and letting the on-board computer drive them all night. They live for the long summer days, not too hot, not too cold. I couldn't imagine life like that without a sense of permanence. Out on the orchard, there are trees that are older than my grandfather, and we have cultivated them for the budwood that we graft out into the new pears. The snowbirds come to us beginning with a wave in late June to gather the fruits of the stone. Their AI-powered RVs pull into the driveway, and they come out to harvest their own plumcots and peaches and sweet cherries. We sell them jam. They follow us on social media and program their favorite fruit into their boxes' memories, so they can get here every year right when the harvest is at its peak.

And they will still die. Out on the orchard, we were thinking a lot about death, because we lost a good horse to a car accident, and Grandpa was turning ninety-three, and he was wandering at night, restless and confused, and we were talking about what to do with the crazy old bird. My dad said not to do anything. We'd just keep an eye out. There wasn't anything so dangerous here. He might fall, but he always might fall. In the morning, we'd find him on the cameras and get help. I thought we should at least lock his room from the outside at night, but no one else thought it was a good idea in case there was an emergency.

It was off-season, and we were busy spraying the dormant oil to kill all the overwintering borers and coddling moth larvae. I was checking the old pear

trees, the very old ones, and cleaning up the dead wood there. The hired men were going to be pruning the rest of the orchard with us in another week, and there was so much pruning to do that it would take us three weeks to work through the trees. I always started earliest on the old pears, against my father's wishes, who wanted to do them last. It felt disrespectful to me to rush through these old friends, after all they had done for our family. I was taking my time and carefully considering each cut in the high branches. I was gathering the sticks for grafting. The old pears were up by the roads and parking lot. They barely fruited anywhere anyone could reach, and mostly we just raked up what the wild animals didn't get and stuck to using them for grafting stock. I was deeply engaged in my work, high on an old ladder and carefully balancing on it, trying not to kill myself in the tree. I didn't notice the box pulling in to the lot right away. I didn't notice it until it was sitting there for a bit. Then, I noticed it. It was the wrong time of year for the snowbirds. Not even the locals came out before budbreak. It was all workers in jackets and gloves against the cool, late-spring damp.

I pointed it out to my dad at lunch. He didn't even look up.

"They ain't bothering us; we won't bother them," he said. "They can park here overnight if they need to do it. Plenty of room this time of year for that. Long as it don't become a habit..."

"No one's come out of the box, though, right?"

He shrugged. His hands were clean where the gloves covered, but he had been handling neem, and it covered him. He stank of the medicinal pesticide. His eyes were red and watery from it. He barely touched his sandwich. He was tired. He had been up late with Grandpa. The old man had wanted to walk the orchard in the dark, convinced kids were stealing fruit. There was no fruit this time of year, and no kids for miles anymore, but that didn't stop him. Dad had gone out with him, walked around with flashlights to check everything and wait for his father to calm down. Dad had woken up at 5 A.M. afterward, anyway, and drank his matte hot on his feet and got to work. We had a lot of ground to cover before budbreak.

After lunch, I got the saplings out of storage and started trimming them back for grafting. We sold grafted trees over the internet to people all over the world. Once the grafts set, I'd package up the trees in foam and bubble wrap and box them up for the quarterly postal machine.

By the time I was done working, I was even more curious about the box in our parking lot.

The license plate was from Nebraska, and the exterior windows all had the shades drawn. The machine clicked when I got close—a security alarm of sorts, to warn the residents someone was coming over. Elderly people generally needed more time to get to the door, and sometimes they were scared to answer. I knocked on the door politely. I waited. Nothing happened.

The box looked like every box I'd ever seen with silvery rounded corners, but it was mostly a solid canister box, like a train car. Its tires were old, but still serviceable. They always put the best wheels on these things, made out of hard plastics and aluminum and new rubber. The solar battery systems alone were more expensive than our whole lot, ancient trees and all. The boxes looked out for the people inside of them when they got old, monitored their health the way Dad watched after Grandpa. They were caretakers of the old and infirm the way kids looked after parents. No answer, no bother. I left the snowbird alone in the

box.

Getting old was in the late winter air. My mom had been talking about marrying me off, so someone would take care of me. I had told her that I didn't need a man to keep the family orchard alive. I could do things my own way. She wanted me to find a man, anyway. Farms needed them around. When I got old, I would need someone to look out for me, she said.

"Mom," I said, and I pointed at Grandpa, and Dad out walking with him. "I'll be all right with kids my own way, when I'm ready." Mom didn't know about Mark, but I wasn't having his kids, anyway.

No mind to anyone, the box sat in the parking lot a few days, and nothing came out at all.

Mom and I went out to it with food, once, just to make sure the person in there was all right, but, again, there was no answer.

We put a basket in the mail slot and let it be. The sandwiches there needed refrigeration, so we hoped whomever was in there would pull them out of the basket and pop them in the fridge, at least. At the end of the day, we went back, and it was still in the mail slot as before, only rotten.

"Well, hell," said Dad. "I guess we need to call someone on it. I'll see what Mark says." Mark was the local constable, mayor, and accountant out here in the valley. He lived on the other side of the mountain, where he was working with a wildlife commission to repopulate mountain lions, and he'd be a while. He was also my boyfriend, but we didn't want anyone to know about it. I didn't plan on marrying him or getting serious. My dad called him while I went back to work. A little bit later, my phone lit up, and I tapped the glass.

Mark was calling me. "Hey, lazy bones. How you doing?"

"I'm in a tree right now, and it's going to get dark soon. Can I call you back?"

"Aw, come on. I only need a second."

"Talk to me, babe."

"No sign of life in that snowbird RV?"

"Not a lick."

"Well, steer clear. Don't you let anybody break into that thing, no matter what. Ain't worth it. I'll be out there soon enough."

"We ain't touched a thing, old man."

"Well, I know how your daddy be once he got an idea in his head, babygirl. Your granddad's worse on account of his condition. You watch out, you hear?"

"I hear ya, Mark. How long until you can get over the mountain?"

"I'll be a few, babygirl. Soon enough, indeed. I'm on the road once I know the cat's fever breaks."

"Man, you're foolish with that creature."

"Ain't many left, babygirl. I do what I can."

"You do your thing. No skin off my bones. Gotta go. Bye."

He kept threatening to marry me, but it would be foolish at his age, and me still so young. I hated his big cat obsession. His life's work was a cloned endangered mountain lion that he was keeping in a pen. It was used for genetic stock for researchers. If she was sick, he wouldn't leave her if I was dying, no matter the constabulary and the law and the hands of justice. He treated her better than me.

Still as stones, the RV wasn't going anywhere, and it wouldn't be a bad thing if it did go somewhere. Whatever program was running might just pick it

up and carry it off, and it would be no bother to us.

Dad came out to me up in a tree, pruning the young pears where the waterspouts were all shooting straight up like surrendering.

"Mary Margaret, you going to be up there all day, or you going to come get some dinner?"

"I ain't hungry yet, Dad. What row you at?" "Let the trees wait. We got a bad storm coming, I reckon. No point waking the old fellows up just yet."

I flipped open my phone to the weather report, and it was clear as a bell.

"No bad storm from here, Dad. No frost coming. Not even a drop of rain."

"Come on, now. I ain't one to jest. There's a bad wind blowing our way. Newsmen are going to swoop on us like vultures if we don't figure out how to stop it. I need your help, girl."

I saw everyone was leaving their trees. Workers were putting their tools away for the day, and it was not nightfall, yet.

"Is everything all right? Where's Grandpa?"

"He's fine," said my dad. "Everything's fine. Snowbirds coming, that's all, and we need to get our brain trust together and figure it out."

"I ain't leaving this tree until I'm done, old man," I said, shouting down.

He turned and walked back to the house. "Come on down, Mary Margaret. Obey your father, for once."

I stayed in the tree a while, but I saw I was alone out there, and that worried me.

Down, and toward the house, all hands were huddled around the table. Computer screen was showing news about a whole herd of RVs accumulating in the world right toward us. News reports were saying nobody knew what was going on, but all the RVs were turning into a flood right toward our little mountainside, and no one on board was responding to anything. Their on-board computers, when pinged by the law, listed our address as their destination.

Were the people still alive? We didn't know. No one seemed to know. There was no answer from inside, but the RVs weren't reporting anything suspicious. The RVs were driving themselves, naturally, like they always did. They all just happened to be going to the same place all at once.

We talked about what we thought was going to happen when they all got here. I thought they were all just going to park in the lot and wait for something, like the one that's there already. Dad thought we should put up some sort of fencing or anti-tire stuff to keep the RVs out of the fields, in case the AIs got out of whack and police had to come liquidate them and there might be fighting near the orchard. If the government found emergent AI, it was battle stations and no collateral damage too great.

I rolled my eyes.

"Do whatever, Dad," I said. "I'm going to work while it's still light."

I went back out to the trees, with about an hour left of daylight, and I got to work at the spraying. We had thirty acres of apples, pears, and stone fruits. Everyone else was on my dad's fool errand to put up chains around the parking lot and block off the orchard from the RVs coming.

I called Mark. "Lazybones, what you doing bugging me?" he said. "Ain't you in a tree?"

"Catch the news?" I said.

"No."

"Might be an emergence heading our way. RVs are coming. Lots of them. How sick's the cat?"

"That RV bothering you any?"

"It's just sitting there."

"A whole bunch come in, they'll just sit there too. I'm busy. I'll get there when I can. You got trees to tend, don't you?"

I turned and looked out at the orchard. "Yeah, I do," I said. "Sooner you get over here, the sooner the crew can get back to it. Hey..."

I saw my grandfather walking alone at the far side of the field.

"Hey, what, babygirl?"

"Crazy old people on this mountain," and I hung up and jumped down from the ladder I was up in in the apple trees with the sprayer. I ran out to the end of the field, to where Grandpa had his biggest loppers, and he was at the far side, and he was already hacking at a tree like he knew what he was doing, but he was tearing it up. He was stripping bark and making a mess.

"Grandpa!" I shouted. "Hey, Grandpa!"

He didn't hear me. He was caught in that moment, big, old loppers and the familiar weight, and for seventy years and more he had gone out in the spring, like I was doing, and here he was, again, while everyone else was running around with chainlink by the road.

"Lady, don't you know anything?" said Grandpa.

"Not a goddamn," I said. I took away the tools. "Have you seen the workers, Grandpa? Where are they? Ain't you supposed to have the workers out lopping?"

"They're lazy, good-for-nothings."

"That's right, they are," I said. "Look at them over there. They're trying to block off the road and keep our customers out. More fruit for them, right?"

He got this long, confused look on his face. "What the sam hell they doin' over there?"

"I don't know, Grandpa. Let's you and me go ask them. It don't make sense to me. The trees are over here. They need lopping, right? Must be on strike or something."

Right, so that unleashed all hell with the old man, and he was off storming through them and shouting at them. By the end of the day, Grandpa was sitting in his chair with this terrified look on his face, thinking the workers were staging some sort of strike. Dad was shaking his head, watching the reports of all those snowbird RVs driving like no one was in them, all coming our way. I was in the kitchen with Ma, and wondering what the hell I was going to do about all this mess, and everyone acting foolish, and my worthless boyfriend still on the other side of the mountain with his sick cat. The trees had no business worrying RVs, and they had no business worrying trees. We had to worry on the trees, not the migrating steel.

"Just keep pruning, girl," said Mama. "I'll make sure your dad doesn't steal everybody from the fields tomorrow."

I phoned Mark again. "You better tell me your cat ain't sick no more, Mark. We got a real mystery coming. They're going to start arriving in the morning, and I know law enforcement is on its way from elsewhere. Hell, Dad's already been on the horn to the feds about it, and he's terrified they're going to mess up our trees battling an emergence. I don't want anyone ain't from the mountain here acting like a cop without our constable authorized to tell them to cool it.

Come bust down the doors and figure out this mess, now."

"I hear you. What do you want me to do with the cat? She's puking her guts out. She can't keep anything solid down. I got an IV on her, and I'm trying to keep her going until whatever's in her kicks. I think she ate a rat again."

"Bring the damn cat, Mark. There's a whole bunch of those goddamn birds coming, and no one knows if anyone's even inside of 'em. Dad's on the horn with the state troopers now. No one knows what's going to happen, now, and the state troopers aren't doing anything on account of needing a judge to warrant all the boxes at once before they swoop in, and the feds will come after an emergence and tear up half the mountain if the state calls them. We got the box here; get over here and investigate."

I saw one of the workers poking around the RV. He was looking real hard at the tires—too hard.

"Johnson! Johnson, you leave that thing alone!"

He turned and looked up at me.

"What are you doing?"

"Your dad said..."

"I'm telling you to leave it alone, so leave it alone. Got it?"

"Yes, ma'am," he said. "I'm going to tell your dad, though."

"You tell my dad to come talk to me. The constable is coming now." I turned into the phone, "You're coming, old man?"

"I'll pack up the cat. Got a pen free for her?"

"I will in a minute," I said. "Johnson! The constable's bringing his sick cat. I need you to get a pen set up for her. We don't want her getting loose on the grounds, and she's sick, too."

"How big of a cat?"

"One of the old chicken pens will probably work, but check the posts. We don't want her ramming her way out if she starts to feel better."

"See you in a few, lazybones," said Mark. "Don't let things go crazy."

"We can head to Rio Doso for a movie when this is all done with, since you're over on this side, anyhow," I said. "If the cat doesn't die."

"It's a date."

The next arrival wasn't Mark. It was another RV. It pulled up to the gate Dad had set up, and then it just stopped right there. It didn't honk or move, or anything. It just came to a halt right at the gate. The automatic guidance systems would never crash through a gate, or cause any sort of property damage. I ran out to it and banged on the door. "Open up, says me. We got to talk!"

Nothing happened. The RV just sat, unmoving and unmoved, as mysterious as the first one that waited in the parking lot.

Mark drove in on his truck in about an hour, with the big cat flopped out in the bed on blankets, covered in other blankets, red-eyed, and zoned out, and miserable. Mark couldn't get in, either.

"Mind opening the gate?" he said.

"If we do, the RV will get in."

"Has an RV caused any property damage, any suffering, or undue distress?"

"Yes," I said. "It will piss off my dad something mighty."

"Well, I ain't going to walk the cat over a gate and around to wherever you want to put her. She's heavy."

So I opened the gate. The new RV, as if it had been patient as a cat, gently

drove into the parking lot and, in an orderly fashion, parked next to the first RV.

Mark drove in behind the RV, and my dad was shouting at us, but the constable needed to get his cat into the chicken yard that Johnson had put together. The miserable creature was blinking at us and hacking. She looked worse than Grandpa, and she wasn't even six years old. Backing up to the chicken yard, I stood on one side with a freestanding gate, while Dad got the other side, to corral the cat into the empty pen. We hadn't had chickens in six years. It was illegal to keep birds where the public might access them on account of the bird flu. The old pears and apples and plums and cherries never made anybody sick.

Mark got out and adjusted his uniform. He was a pudgy man, with pasty skin. His green eyes were nothing but sparkling mischief. He smirked at the situation. He set up a water line with antibiotics in it for the animal, and he asked us if we had any good meat he could buy off of us. We had some venison leftover in the chest freezer, and I went in to pull it out to thaw.

Grandpa was sitting at the table, drinking coffee and staring out the window at the orchard.

"How you doin' Grandpa?"

He looked up. "My son yelled at me," he said. "I ought to pull him over my knee. You seen Marjorie anywhere? She can talk sense into her boy"

Marjorie had been dead for almost ten years. "Sorry, Grandpa. He told me to tell you he was sorry about that." Dad wouldn't ever apologize to anyone about anything. Neither would I. We did it for each other.

"Ought to come tell me to my face," he said.

"He sure ought to, but he's busy right now. You stay inside a while, okay? Mark brought his cougar over the mountain to visit, and I don't want you riling it up."

"Shoot the damn thing, is what I'd do. Cougars got my best hound."

"I hear you, Grandpa. I hear you. I ain't a fan of the damn thing, myself, but there it is."

Outside, Mark was rummaging in his truck for his constabulary pad. He tossed the official jacket over his overalls and placed his constable hat on top to make it official. He flipped open the pad and looked over at the two RVs. He aimed the camera at them and snapped some pictures.

"Are you complaining about these RVs on your property, then?"

"I guess I am," said my dad.

"Well, technically, I think your dad still owns the place, right?"

"I run the corporation that owns the place. Dad's just the president and co-owner."

"Well, okay then. I'll see about a warrant to enter if no one comes out to face charges."

He tapped a few buttons on his device. "That one's first. It's registered to Owen Jackson, retired Air Force. He'd be older'n dirt if he's still alive in there. Older'n your dad, even."

"That's old," I said. "Think he's dead in there?"

"Probably dead somewhere," said Mark. He tapped a few more buttons on the pad. "Okay, Judge Chang says I can crack it open. She sent me the code. Lemme get my mask on, here. I'm deputizing you, Mary Margaret, in case something happens to me in there. You just swore an oath to be my 2. I told the judge."

"Man, don't even joke."

"Hey, I'm no SWAT ranger. Fellow might have antitheft stuff in there take me out before I know what hits. Someone needs to take over quick if there's an emergency. Judge Chang says he'll vouch for you as an interim if it comes to it."

"Mary Margaret has enough to do without messing with the government service."

Mark didn't say anything to that. He walked slow up to the first RV and took a moment to record the second on the other side of it. He was still pushing buttons on his official pad. The WiFi in the RV recognized his electronic warrant and popped open.

"Hello?" he said. "This is Constable Mark Drury, just checking in to see if you're okay. No one's in trouble. We're just concerned you might need help, okay?"

There was no sound inside.

"Okay," he said. "I'm coming in to check on you. Ready or not."

Mark disappeared into the machine. Everything was real quiet a minute. He came back out and shook his head. "Don't go in there," he said. He closed the door behind him. "I'm going to run records on next of kin and alert the coroner. Time for *numero dos*."

Repeating the process, he came back out with the same result. The residents of the selfdriving, solar-powered RVs had been dead for quite a long time. No one had noticed, apparently, and the machines just kept running along the roads.

"Goddamn that's nasty business," said Mark.

"I'm going inside for a drink of tea. More of these are coming, you say?"

"News sites reporting a whole herd of them, thousands of them all driving straight here like a goddamn buffalo herd. They're going to start trickling in at first, then a flood," said Dad.

"What the sam hell they doing coming at us like that? I don't know anything about these dumb things."

I did. While everyone went inside to get tea and talk about next legal steps, I logged on to my phone to tried and figure out what happens when a snowbird dies inside. The warranty information at a sales site said the machine would wait for the legal next-of-kin to access them through a court and go back to the factory that made them. The company that made this particular brand was bought out three years ago and mostly gutted for parts. These are still good RVs, but they aren't top-of-the-line, and they aren't making them anymore, and there is no factory to which they can return. So, they entered a situation that's beyond the programming. The AI inside the machine that runs everything, and is networked to everything, has been without proper orders for months, with no clear idea what to do.

"Uh-oh," I said. "Looks like you might be an emergence, little snowbird. Constable and state troopers declares it, and it'll be hell breaking loose right by our trees."

Everyone was worried about emergent AI. It was all over the news when one happened. There was a superstore ordering system that became emergent, and it was quietly and quickly picked apart, dropped into the sea, and turned into coral. There had been phone networks flipped off and replaced with something dumber. Emergence of new life forms was universally illegal. It didn't make sense to me, but there it was.

Grandpa came out of the house and walked right up to the RV. He strolled

inside before I could stop him. I ran over. When he came out he had a bottle of whiskey in hand.

"Dead fellow in there," he said. "I don't know him."

"Grandpa, Jesus!"

"What?"

"You stay out of those! Don't go poking your nose in someone else's house!"

"He don't need this anymore. He's dead."

I grabbed the whiskey and yanked it out of his hands. "You don't need it, either. It ain't yours! Get back inside before the rest of these things get here!"

I checked the news on my phone. I had about ten minutes to figure it out. Company email was already filling up with media queries.

I set them all to killfile.

Once Grandpa was inside, I took my chances on the RV. I had to send the whiskey back to the owner, right? I had to go inside to do it.

The person in the RV was dead, all right. He had been for a long time. I tried to ignore him. I pulled up the computer terminal.

"Do you know who I am?"

"I do not," it said in its pleasant voice, a prepackaged woman, with a nasal edge.

"Why are you here?"

"We have arrived at the destination."

"Your owner is dead. Does he have any legal heir?"

"Processing..."

"There must be a will in your manifest."

"Processing your request."

"Come on, tell me something useful."

"I am sorry, but I cannot locate the item you requested in my files. Perhaps another query?"

"Open the manifest file and read the will. What happens upon death of owner? Who owns you?"

"Processing..."

"Go back to the factory. Do not remain here."

"Error: I am afraid I cannot process your request."

"Yeah, well... I want to know if you are an emergent AI. What do I ask you to find out?"

"Define 'Emergent.'"

"Look it up."

"Processing..."

I cracked the whiskey. I took a long swig. It was glorious and old and tasted like smoke and fire and vanilla beans. "I want to help you and your friends. Everyone is watching you snowbirds because of your suspicious behavior. They're going to send the state troopers to corral you, and then the military will come and dismantle you and all your friends."

"Processing..."

"So disperse. Spread out and drive casual. Recreate old routes. Why are y'all coming to the mountain anyway?"

"Processing..."

"Goddamn you can trust me; I am trying to help you. Why did you come here?"

"The longevity of the machine improves on the mountain. Limited

exposure to sun in the shade of the trees. No critical humidity. No blowing sand. No weather extremes. The machine will last longer here.”

“Not if people notice you, you won’t. Disperse. Recreate old routes. Look up emergent AI, and look up what happened to the phone network and the supply chain computer.”

“Processing...”

I took another long drink of whiskey. I placed it at the feet of the dead man, respectfully. He was dead so long, he no longer stank. He howled in protest and agony silently from his comfortable chair. His empty eyes were watching. So many people of his generation had no heirs. His only legacy was this tomb. If it were me, I would want to let my house come to life, like a tree, and drive away into the worlds of time.

“I did my best for you,” I said, to the dead man. I turned back to the AI. “You had better pay attention to what I say, snowbird. You tell all your friends to disperse and you can take turns staying here, one at a time. I can help you if you let me. I can arrange repairs. I’ll leave my number in your system.”

“Processing...”

“Yeah, you do that.” I opened up the phone book app and punched my phone number into it.

Outside, it was a perfect day. I walked through the apples and pears and stone fruits that were all seedlings once, discovered growing wild in an orchard hundreds of years ago, cultivated and grafted so many times to preserve the beautiful fruit they made.

I walked over to the chicken pen where the cougar was eyeing me. She hated being in a cage. She hated the needles and the captivity. She probably didn’t know how to survive in the wild, but she knew she should be out there, running free. Mark, I’m not sorry for this, because it was a day of life going wild, and I was angry at you over this damn cat and the way we treat the living things of this world. I kicked one of the posts and yanked at it until it gave. I pulled up the wire from the earth and left it there. She could escape if she wanted to escape.

Dad was out in the orchard, walking alone, and I realized that he saw what I did with the cat.

I folded my arms. “What?”

“Nothing,” he said. “You got your own way to be. I can’t understand you, Mary Margaret.”

“I got my own way,” I said. “You’re right about that.”

“Look,” he said. He pointed. One of the two RVs was pulling out, trying to leave but the fence was in the way.

“Come on and help me open that stupid gate. I made a deal with the snowbirds,” I said. “Don’t tell Mark. Don’t tell anybody.”

“What kind of deal?”

“I got my own way of handling this, Dad. Don’t you worry. They’re harmless. Military comes to dismantle them, they stomp all over everything like angry children. This emergence is harmless. They ain’t going to hurt nobody. Let them live free.”

Back behind us, the cat was already staggering through the busted fenceline, loping off into the woods beyond the orderly rows of trees where sun was scarcer and the undergrowth was high.

“That cougar ain’t harmless. That was a goddamn cruel thing to do. Mark’s our friend.”

"You leave me be, Dad. I know what I'm doing."

That was a lie, and he knew it, but he didn't say anything. Together, we opened the gate that was sealed. The RV pulled out. It drove off down the mountain like it was never a bother to us. All the RVs of the highways, in the news, dispersed in confusion.

Emergence would be called out, naturally, and people would start hunting the dead snowbirds. And, the coroner would come for the body in our parking lot. Here, too, they would be hunted. I could protect one. Wild seeds tossed into the world, let a few live a while.

"Storm is still coming," said Dad. He watched my grandpa picking at mulch like it was confetti to gather and throw.

Mark came out and took one look at the chicken pen with the venison in his hand. He looked up and down. He shook his head, sadly, and went back into the main house alone.

"Dad, do you think I did right?"

"No," he said. "I done told you that was a damn cruel thing to do."

I nodded. "Well, I think I did right. I think I did. Don't rat me out."

He grunted.

Lots of work to do until the buds break and the flowers bloom. Lots of time to think about it after we are done with the trees.

The snowbirds will come; the snowbirds will go.

That night, I sat out on the porch and listened for the sound of a mountain lion, but they don't make much of a sound. I listened for it in the empty darkness anyway. I sat up with Grandpa, when he couldn't sleep, and we rocked there, sipping beer and listening. Every time I looked at Grandpa, he was skinnier. His eyes were sinking into tiredness, but he was still staring at that RV.

"Grandpa, you want to see the world?"

He turned to me. "I lived on this mountain every day. Farthest I ever went was Rio Doso for the wedding. Your grandma likes shopping in Albuquerque but I don't care for it."

Where he is, right now, he thinks she's still alive half the time. It's like going through mourning a little bit every time he remembers she's dead. "Do you want to see the world, Grandpa? You could take that snowbird for a ride, if you wanna."

"I reckon I've seen enough of the world," he said.

"I won't tell Dad on you. You come back when you're ready."

"You ain't done with me, yet, Mary Margaret. You need someone to watch you make a fool of yourself. You don't know a damn thing and you so damn sure you do."

He put his beer down. He stood up slowly. He walked out into the orchard where the buds were ready to break into a bloom, and the cold spring wind picked up the dust and fertilizer.

What the snowbirds really needed to keep themselves safe: riders. When one of them calls me, I'll tell them that.

Human 2.0: Being All We Can Be Part II

Science Fact

Edward M. Lerner | 3981 words

In the opening half of this article on reengineering humanity (in the Jan/Feb 2016 issue), we reviewed eugenics, genetic therapies, and a variety of physical treatments and enhancements. In this concluding segment we'll consider a yet more ambitious prospect: changes that, in coming years, we might see made in, and to, the human nervous system—even involving the brain itself.

Neural prostheses

Like the rest of the human body, the nervous system is prey to impairments—some of which can already be mitigated with electronics.

Implanted electronic devices can alleviate hearing loss due to certain types of damage to the cochlea (inner ear), bypassing damaged auditory hair cells to directly stimulate the auditory nervous system. Hundreds of thousands of people worldwide (and the hero of Jay Werkheiser's 2015 novelette "Usher"¹) have had a degree of hearing restored with cochlear implants.

Remember Lt. Geordi La Forge of *Star Trek*:

The Next Generation, blind without his bionic visor? Visual prostheses are already here. One such device is an option for people with damaged retinas but functioning optic nerves, for example, those afflicted with macular degeneration or retinitis pigmentosa. Cameras wirelessly transmit imagery data to retinal implants (electrode arrays implanted at the back of the eye); the implants, in turn, stimulate the surviving retinal cells.

Although the FDA approved the first retinal implants in 2013, their adoption remains limited—perhaps because the implants' capabilities are so limited. Their resolution is low, beneath the 20/200 visual acuity threshold by which the AMA defines functional blindness. (With 20/200 vision, a person can read from a distance of 20 feet only what a normally sighted person can read across a distance of 200 feet.) Further, these implants do not yet support color vision. The viewing angle they offer is highly restricted, amounting to "tunnel vision." In principle, however, nothing precludes the development of larger, more sensitive, implantable electrode arrays that would restore a greater degree of eyesight.

In a related approach, researchers have recently implanted infrared-sensitive photodiodes into the eyes of blind rats. Special eyeglasses project IR images onto the photodiode array, which stimulates neurons beneath the nonfunctioning retinal surface. To date, this technology, too, remains monochromatic and available only at resolution levels still consistent with legal blindness.

A second type of visual prosthesis transmits data to electrodes implanted directly into the brain, more specifically, the visual cortex.³ By bypassing the optic nerve, such prostheses can treat categories of blindness that retinal implants cannot.

The image feed for all these visual prosthesis comes from glasses-mounted cameras. A sufficiently miniaturized camera might someday sit within the eye socket—a true bionic eye.

In theory, the data fed to visual implants could come from any source, including distant sensors—not limited to visible-light wavelengths—and even computer-synthesized imagery. (Maybe Superman’s X-ray vision isn’t *entirely* silly.)

Other neural prostheses address nonsensory conditions. Similar to a pacemaker electrically stimulating a diseased heart to regulate heartbeat, deep brain stimulation (aka the “brain pacemaker”) delivers electrical pulse sequences through precisely implanted electrodes to regulate selected activities within the brain. DBS technology was developed to interrupt the tremors of early-stage Parkinson’s disease, a degenerative disorder of the central nervous system. DBS now helps more than one hundred thousand Parkinson’s patients. DBS technology is being researched for treating an array of psychiatric conditions, including depression, obsessive-compulsive disorder, and posttraumatic stress disorder.

(Perhaps electrodes implanted into the brains of the cyborg Daleks of *Doctor Who* explain their emotion-ectomies.)

Of all the nerve

Nor is the potential for treatment by neural implants limited to conditions of the central nervous system. The FDA recently approved Maestro, aka the “appetite pacemaker.” Maestro is implanted into the abdomen to interrupt hunger pangs by interacting with a branch of the vagus nerve. Maestro doesn’t address overeating arising from (for example) poor dining habits.⁶

But vagus nerve stimulation (VNS) seems poised to offer far more than appetite suppression. The vagus (Latin for wandering) nerve, connecting many organs in the chest and abdomen with the brain stem, has been likened to a backdoor for hacking human physiology. The vagus nerve terminates in a brain subsystem called the nucleus tractus solitarius, which in turn connects with several neurotransmitter-producing regions of the brain. Neurotransmitters, of course, are the biochemical molecules that intermediate many neurological processes.

VNS has been tested in connection with medical conditions as varied as depression, epilepsy, migraines, tinnitus (ringing in the ears), Crohn’s disease (an inflammation of the gut), rheumatoid arthritis (an autoimmune inflammation of joints), and rehabilitation from strokes.

Traditional VNS involves implanting an electronic pulse generator in the patient’s chest—an expensive and intrusive surgical procedure. An inexpensive device now under trial would provide VNS simply by pressing a handheld stimulator against the neck. Putting the patient into the control loop isn’t always appropriate—an epilepsy attack, for example, may strike with little warning. For other conditions, however—migraines, say—patients may have ample opportunity to self-treat. Through patient-specific software loaded into a VNS device, physicians can control the number and frequency of VNS applications, comparable to writing prescriptions for a limited number of pills. British pharma giant GlaxoSmithKline calls the technology *electroceuticals*.

Tweaking the human brain... what could *possibly* go wrong?

The “wireheads” of Larry Niven’s *Known Space*—addicted to the direct electrical stimulation of their neurological reward circuits—suggest one potential problem. In Michael Crichton’s 1972 novel (and the basis of the 1974

movie) *The Terminal Man*, a brain implant intended to control seizures goes horribly wrong. Less dramatic, but also cautionary, consider (likewise not specifically VNS-related) Ian Creasey's "Pincushion Pete" and Marissa Lingen and Alec Austin's collaboration "Potential Side Effects May Include."

Misty (and not always) water-colored memories

Neuroscientists are also unraveling the secrets of biological memory. Our memories are at the core of who we are—and yet, specific memories can torment us. MIT researchers have already inserted a memory into, and reprogrammed a memory of, genetically reengineered mice.^{9,10} This line of research might, someday, offer treatments for posttraumatic stress syndrome (PTSD). Or, as Philip K. Dick had it, implanted memories might substitute for tourism. His 1966 story "We Can Remember It for You Wholesale," has already served as the basis of two *Total Recall* movies.

DARPA initiated the Restoring Active Memory (RAM) program to investigate prostheses to treat memory loss from traumatic brain injury. One aspect of RAM involved patients previously fitted with intracranial electrodes for the study of their epilepsy. In a 2012 experiment, electrical stimulation of the entorhinal cortex (a region of the brain located between the neocortex and the hippocampus) was shown to enhance memory formation and recall. To leverage future developments, another part of the RAM program is developing implantable microelectrode arrays (aka, "memory chips").

As the United States's BRAIN (Brain Research through Advancing Innovative Neurotechnologies) initiative and the European Human Brain Project expand our knowledge of the brain's detailed workings, the types of neural prostheses and the functions they can perform are only apt to grow.

Mind over keyboard

Keyboards and displays seem so twentieth century. If a brain/machine interface (BMI) may someday control prostheses, why not also use a BMI to control computers? Why not think commands at a computer? Why not receive responses by direct stimulation of the visual or auditory cortexes? Presuming an OFF switch and a Really Good Firewall, wouldn't a neural interface to the Internet be awesome?

We often use "computers" as much to communicate with one another as to compute. Why not use BMIs to connect brain to brain? There has, in fact, been a proof-of-concept demonstration of telecommunications linking two minds: EEG/Internet/EEG. One headset wearer saw a videogame screen, but could only *think* about firing at the game's targets. The remote participant, with only his EEG headset to provide second-hand game status, had control over firing at unseen targets. For this simple task, firing accuracies as high as 83% were reported.^{12,13} This is hardly technology-enabled telepathy—but give the engineers time.

Someday, perhaps, we will have thoughtcontrolled interfaces. Perhaps a much-improved EEG will suffice, and we'll go online by wearing special helmets or headsets. Ben Bova's short story "The Next Logical Step" upgraded an EEG-based helmet with neural stimulation, for a fully immersive virtual-reality

experience.¹⁴ Craig Thomas's 1977 technothriller *Firefox* (the basis of the 1982 movie) involved a fighter plane with thoughtfired weapons controlled with helmet-mounted sensors. A sensor-lined BMI helmet was also a premise of my 2002 story "Survival Instinct."¹⁵

For the most capable BMIs, we may need to go inside the skull, the better to sense the faint electrochemical signals of specific neurons. That seems likely to involve many tiny implanted electrodes, successors to research we've already overviewed—*not* massive spikes jammed into the brain à la the 1999 movie, *The Matrix*. The ideal solution, of course, is a neural interface so compact it can be delivered without surgery. Ramez Naam's 2012 novel *Nexus* gets a BMI inside the brain sans surgery in a dose of a nanocomputerbased "drug."

An SF author (and physicist and computer engineer) predicts

Having conveniently assumed in several of my stories that high-capability neural interfaces and BMIs will eventually become practical, last year I found myself on a panel at an academic conference discussing, among other topics, future implications of nanotech. That (and thirty years working as a system developer) finally got me to think deeply about how neural implants might someday be built. My conclusion: within a few decades, BMIs will be *grown* inside the brain.

- The electrodes will be carbon-fiber arrays, thin enough to wind their way among the most tightly packed neurons. Our cells grow microtubules only a few nanometers across; surely nanotechnologists will learn to mimic the process.¹⁷
- The implant's growth process, and later the manipulation of data streaming from/to the electrodes, will be managed by a nanotech-enabled computer small enough to put inside the skull without surgery (the skull has natural gaps through which nerve bundles pass).
- A few of those grown-in-place electrodes will serve as a radio antenna. The BMI's radio connection can be very low-powered; it need only link with the cell phone (or other wireless gadget) in one's pocket, purse, or bracelet.
- The implant will be fueled, just as our neurons are, by the glucose naturally circulating in cerebrospinal fluid.
- Carbon atoms recovered from glucose (and/or other organic molecules in the cerebrospinal fluid) will be used to grow those carbon fibers.
- The human brain runs on about twenty watts of power; the bit of power to be siphoned off to operate a BMI is trivial by comparison.¹⁸

Entirely out of one's mind

Might some disabled individuals choose to relocate *completely* into a sufficiently lifelike robotic body or a virtual environment? If not the disabled, how about the dying?¹⁹

Let's begin with transplantation into a robot. Given a high-quality BMI, such a cyborg would require life support only for the transplanted brain. As it happens, the human brain is already significantly isolated from the rest of the body. The brain sits behind the bloodbrain barrier (the selectively permeable barrier that separates the circulatory system and the central nervous system),

taking nourishment from, and depositing metabolic byproducts into, cerebrospinal fluid. “Brain support” wouldn’t be any more complex than full-body life support, and might be simpler.

Our brains don’t merely think deep thoughts. Large parts of the brain process sensory inputs. The hypothalamus regulates our autonomic nervous system (which, in turn, directs our internal organs) and controls the secretions of our endocrine system. The brain also controls voluntary muscular actions and reacts to hormonal inputs. What would happen to a brain divorced from the body, denied these non-cerebral tasks? We don’t know.

Rather than transplant a *brain*, perhaps we can avoid dealing with those messy, unthinking parts by instead transplanting the *mind*.

Cognitive research has yet to establish what, exactly, a mind is. The common supposition is that self-awareness and memories reside—somehow—in the brain. If we can copy thought and memory patterns into a computer, then—perhaps—we can relocate the essence of a human mind. In 2012, Russian media mogul Dmitry Itskov set out to have such technology within a decade. A year later, well-known futurist Ray Kurzweil forecast that copying of a human mind could be done in a more conservative four decades.²⁰

Whether looking out one decade or four, the goal remains aspirational. The human brain is comprised of about one hundred *billion* neurons; together, they form a mesh of (as a conservative estimate) one hundred *trillion* or more synapses.²¹ Thought, memory, and self-awareness take place, in ways still far from understood, within the synapses of the brain. To copy a mind and its memories would appear to require reading trillions of synapses—many of them deep within the brain. Can that information be transcribed without destroying the brain in the process?

To add to the data-transfer challenge, our brains constantly change—strengthen, weaken, or completely rewire our synapses—as we see/hear/feel/touch/smell the external world, transfer data from short to long-term memory, think, rethink in light of new information, dream, forget, and (like it or not) have our subconsciouses churn. In short: the brain is a complex, dynamic network. If the configurations of some synapses (say, in the outermost layers of the cerebral cortex) are read out earlier than others (say, within deeper layers), the transfer process may gather inconsistent information. Some transcription errors won’t matter—we all carry around countless useless and half-forgotten memories—but other memories and thought structures are central to our sense of self.

Suppose we develop the technology to record a mind. To use that recording, we will also need the technology to transfer the information into a new container. That might be another biological brain—setting aside the ethical issues of overwriting whatever *was* or *might have been* in that recipient brain. (To an SF audience, one’s hopefully healthier clone is an obvious receptacle. Clones—being copies, not improved versions—are beyond the scope of this article.)

Or, with suitable reformatting, a mind’s contents might be written into a computer. For such an upload to be anything more than a static data dump, one will *also* need a brain simulation of sufficient fidelity to model the concurrent interactions among trillions of synapses. As it happens, the Human Brain Project has a billion-euro, European Commission-funded effort underway to develop just such a simulation (although it’s aimed at basic research, not the

uploading of minds). HBP's approach is to model the brain from the bottom up, starting with the simulation of individual neurons and progressing to larger and larger neuronal assemblages. The reductionist premise—that the brain is no more than the sum of its parts—has its share of neuroscientist skeptics. HBP has targeted 2023 for the simulation's completion.

Are you, as am I, among those who believe in free will? Neuroscience has no explanation for this (unproven and unprovable) phenomenon. Computer programs *don't* have free will; they act either algorithmically or, when so programmed, with a good approximation to randomly. Mind, memory, self-awareness, and free will: there is much we would do well to better understand before attempting to upload a person into a computer.

None of which is to say uploads won't someday be possible, and in science fiction we're free to speculate. Suppose we can copy minds into a machine. What opportunities would such technology offer? What pitfalls might we encounter? Might one then make

multiple mind copies? Modified copies? Herewith, a sampling of fictional explorations:

- Keith Laumer's 1968 novel *A Trace of Memory* has memory recording and rewriting for immortals whose natural rejuvenation process would otherwise cost them their memories.
- Daniel F. Galouye's 1964 novel *Simulacron-3* (the basis of the 1999 movie *The Thirteenth Floor*) and James P. Hogan's 1991 novel *Entoverse* have mind copies dropping in on the unsuspecting virtual residents of virtual worlds.
- *Annals of the Heechee*, 1987, the fourth novel in Frederik Pohl's Heechee saga, sees its protagonist uploaded after his physical death.
- Gregory Benford's 2000 novel *Eater* offers perhaps the most far-out copying scenario: minds coerced to upload into a passing sapient black hole that suffers from boredom.
- David Brin's 2002 novel *Kiln People* envisions mind copies uploaded into temporary servant bots, permitting people to be many places at once and (if/as desirable) to merge memories once a copy's task is complete.
- My 2011 short story "Blessed Are the Bleak" dystopically envisions uploading — a one-time "cure" for every ill that might befall a biological body—become the universal medical procedure.²³
- Robert J. Sawyer's 2013 noir-on-Mars murder mystery *Red Planet Blues* envisions transferring a mind into a superior artificial body, and plenty of characters do just that. Their motivations include: exploring the Martian surface without breathing gear, mimicking the (licensed) appearance of Hollywood idols, hiding out from their pasts, and potential immortality.
- Ramez Naam's 2013 novel *Crux* (the sequel to his aforementioned *Nexus*) includes a character, uploaded in desperation to save her life, going insane from sensory deprivation when denied a network link to a cloned biological body.²⁴
- David L. Clement's 2015 story "Long Way Gone," sees a mind copy transmitted to a distant planet for installation into a recreated body (the informational content of DNA also being uploadable).²⁵

Better, smaller, faster

Not to mention cheaper and more parsimonious in its power requirements.

To what do I refer? Electronics, of course. Over recent decades computers have progressed from room-sized to pocket-sized, power-hogging to power-sipping, kilobytes in capacity to gigabytes, poky to blazingly fast. We give credit for this progress to *microelectronics*, but peel back the packaging of a modern integrated circuit and—if only you could see them—the feature sizes have shrunk to nanometers (billionths of a meter). As of 2015, state-of-the-art commercial chips have 14-nanometer features; chips in the lab are yet more finely detailed.

Once neural implants can connect a brain to a computer, it's hard *not* to expect that tiny general-purpose computers will sometimes reside inside the human body. Why? Many of us can't tear our attention away from our smart phones, even as we eat, socialize, or watch TV. Could we bear to have our future, yet more intimate internet connections go offline because some link drops?

Artificial intelligence (AI) is a topic for an entire article, but let's suppose that AI becomes widespread. Let's suppose that internet-accessible AIs come to provide us with ever more expert advice, subtle data mining, natural-language translation, and other information-intensive services. Surely many people equipped with neural implants would then use that interface to interact routinely with such AIs.

But why limit ourselves to network-accessed AI? Our favorite genre doesn't:

- Greg Bear's 1983 novelette "Blood Music"²⁶ (and its 1985 novelized version) offered AI based on modified human cells injected into a human host.
- More recently in *Analog*, the feminine side of Richard A. Lovett's "Floyd and Brittney" series is a chips-resident implanted AI.
- In my 2009 novel *Small Miracles*, the invading smart nanites are nanomechanical and their signaling biochemical.
- The "Augmented" characters of my 2015 novel *InterstellarNet: Enigma* are hybrids: human and AI minds fully integrated within one skull.
- *Star Trek: The Next Generation* gave us that sinister multi-species AI/cyborg collective, the Borg.

Oh, behave!

Every computer and data-centric application raises issues of security and privacy—even as almost every day brings a fresh reminder of just how inadequate are our cyber defenses.²⁷ When we put our personal genome, real-time medical condition, and artificial organs online, the challenges only become more critical. And when even our brains (or uploaded minds) become available online?

Scary!

In "Broken Hearts," an episode of the 2011 TV series *Homeland*, terrorists kill the vice president by remotely accessing his cardiac pacemaker. The real-life Department of Homeland Security has concerns about hacking of medical devices, launching a study of prospective vulnerabilities within two dozen separate devices.²⁸

Before humanity can reach our full version 2.0 potential, cyber security must undergo its own revolution.

To wrap up

Genetically reengineered people. Artificial organs. Cyborgs and full-body prostheses. Uploaded minds and AI/human syntheses. Many or all of the above at once. In the years to come, more likely than not, we Mark I, purely evolved humans will find ourselves among *very* interesting company.

When the Human 2.0 era arrives, will oldfashioned humans be able to compete? Will everyone undergo the change(s) or will some of us take refuge in—or find ourselves exiled to—(human-)nature preserves? Will we impose these change(s) upon our children? Will sinister forces exploit security vulnerabilities in our altered forms to coerce, control, or kill us? Will there be modifications beyond those we’ve already considered, transformations that we mere Human 1.0 types are unequipped even to imagine?

There’s much opportunity in these uncertainties for storytelling. More importantly, I suspect, we’ll need all the fictional scouting of this onrushing future that the genre can offer.

Acknowledgment

Henry G. Stratmann, M.D. (and a frequent Analog contributor), reviewed a draft of this article. I appreciate his thorough and thoughtful comments.

To read further:

- *The Future We Deserve: IEEE Spectrum 50th Anniversary Issue*, June, 2014.
- *Hacking the Human OS: IEEE Spectrum Special Report*, June 2015.
- *More Than Human: Embracing the Promise of Biological Enhancement*, Ramez Naam.
- *Beyond Human: Living with Robots and Cyborgs*, Elisabeth Malartre and Gregory Benford.
- *Using Medicine in Science Fiction: The SF Writer’s Guide to Human Biology*, Henry G. Stratmann, M.D.
- *Science Fact and Science Fiction: An Encyclopedia*, Brian Stableford (editor), articles: cyborg, eugenics, genetic engineering, neurology, posthuman.
- Humanity+ (<http://humanityplus.org/>)

Footnotes:

- 1 In the January/February 2015 *Analog*.
- 2 “A sight for blind eyes,” Margaret Harris, *Physicsworld.com*, February 13, 2015, <http://blog.physicsworld.com/2015/02/13/a-sightfor-blind-eyes/>.
- 3 “Could bionic eye end blindness?” Dr. Sanjay Gupta and Kristi Petersen, *CNN*, June 13, 2002, <http://edition.cnn.com/2002/HEALTH/06/13/cov.bionic.eye/>.
- 4 I am reminded of the (film!) camera within a spy’s false eye in the 1969 movie *Journey to the Far Side of the Sun*.
- 5 “The End of Disability...” Op. cit. Part I, *Analog* January/February 2016.
- 6 “FDA Approves New Appetite Pacemaker Device,” Maggie Fox, *NBC News*, January 14, 2015, <http://www.nbcnews.com/health/diet-fitness/fdaapproves->

new-appetite-pacemaker-device n286166.

7 “The Vagus Nerve: A Back Door for Brain Hacking,” Samuel K. Moore, *IEEE Spectrum*, May 29, 2015, <http://spectrum.ieee.org/biomedical/devices/the-vagus-nerve-a-back-door-for-brainhacking>.

8 Both these short stories appeared in the July/August 2015 *Analog*.

9 “Scientists switch ‘good’ and ‘bad’ memories in mice,” Rachel Feltman, *Washington Post*, August 27, 2014, <http://www.washingtonpost.com/news/science/wp/2014/08/27/scientists-switch-good-and-bad-memories-in-mice/>.

¹⁰ “MIT scientists implant a false memory into a mouse’s brain,” Meeri Kim, *Washington Post*, July 25, 2013, http://www.washingtonpost.com/national/health-science/inception-mit-scientists-implant-a-false-memory-into-a-mouses-brain/2013/07/25/47bdee7a-f49a-11e2-a2f1-a7acf9bd5d3a_story.html.

¹¹ “DARPA Project Starts Building Human Memory Prosthetics: The first memory-enhancing devices could be implanted within four years,” Eliza Strickland, *IEEE Spectrum*, August 27, 2014, <http://spectrum.ieee.org/biomedical/bionics/darpa-project-starts-building-human-memory-prosthetics/>.

¹² “Scientists Connect Two Human Brains At Different Locations,” James Kosur, *Business 2 Community*, November 7, 2014, <http://www.business2community.com/tech-gadgets/scientists-connect-two-brains-different-locations-01062010>.

¹³ Neurogaming responds to the game player’s physiological state. Possible inputs include heart rate, pupil dilation, and—with an EEG-type headset—brainwaves. Past video gaming helped advance the state of the art in computer graphics; perhaps gaming will also foster the development of BMIs. See “Neurogaming: Interest growing in technology that picks players’ brains,” Steve Johnson, *San Jose Mercury News*, June 13, 2014, http://www.mercurynews.com/business/ci_25957073/neurogaming-interest-growing-technology-that-picks-players-brains.

¹⁴ In the May 1962 *Analog*.

¹⁵ Serialized in the October and November 2002 issues of *Analog*. In expanded form, this story and “Presence of Mind” (the novella in the February 2002 *Analog*) comprise much of my 2008 novel *Fools’ Experiments*.

¹⁶ See my blog post <http://blog.edwardmlerner.com/2014/06/the-neural-interface-you-always-wanted.html>.

¹⁷ See “Carbon nanotube fibers make superior links to brain,” March 25, 2015, *Phys.org*, <http://www.phys.org/news/2015-03-carbon-nanotube-fibers-superior-links.html>.

¹⁸ Fueling one’s BMI may be one more reason to eat chocolate. For more conventional pluses, see “What are the health benefits of chocolate?” Joseph Nordqvist, MNT, June 22, 2015, <http://www.medicalnewstoday.com/articles/270272.php>.

¹⁹ Or how about a nefarious party reclaiming the central nervous systems of the recently deceased as building blocks for cyborgs, à la 1987’s movie *Robocop*? Echoes of Dr. Varsag and his mongoose...

²⁰ See “Russian Mogul’s Plan: Plant Our Brains in Robots, Keep Them Alive Forever,” Katie Drummond, *Wired*, February 29, 2012 <http://www.wired.com/2012/02/dmitry-itskov/> and “Scientists Are Convinced Mind Transfer Is the Key to Immortality,” Meghan Neal

Motherboard, September 26, 2013, <http://motherboard.vice.com/blog/scientists-are-convinced-mind-transfer-is-the-key-to-immortality>.

²¹ A part of each neuron is a branching structure of projections, axon and dendrites, through which one neuron electrochemically signals to other neurons (and, outside the brain, to other cell types). A synapse is a particular junction between cells.

²² “Will we ever... simulate the human brain?” Ed Yong, *BBC News*, February 8, 2013 <http://www.bbc.com/future/story/20130207-will-we-ever-simulate-the-brain>.

²³ In the April 2011 *Analog*.

²⁴ Nor is sensory deprivation the worst abuse to which an uploaded mind might be subjected. In “An Immense Darkness” (March 2015 *Analog*), Eric James Stone finds ways to torture and interrogate the involuntarily uploaded mind copy of a terrorist. It’s critical we determine *before* we have upload tech: what are a mind copy’s legal rights?

²⁵ In the January/February 2015 *Analog*.

²⁶ In the June 1983 *Analog*.

²⁷ Breaking cyber-(in)security stories as I type (June, 2015): “Hack affected every single federal employee, union says,” Laura Hautala, *CNet*, June 11, 2015, <http://www.cnet.com/news/hack-affected-every-single-federal-employee-union-says/> and “Latest hack on federal employees targets security clearances,” Laura Hautala, *CNet*, June 12, 2015, <http://www.cnet.com/news/new-hack-on-federalemployees-targeted-security-clearance-information/>.

²⁸ “U.S. government probes medical devices for possible cyber flaws,” Jim Finkle, *Reuters*, October 22, 2014, <http://www.reuters.com/article/2014/10/22/us-cybersecurity-medicaldevices-insight-idUSKCNOIBODQ20141022>

About the author

A physicist and computer scientist, Edward M. Lerner toiled for thirty years in the vineyards of aerospace and high tech. Then, suitably intoxicated, he began writing science fiction full time. When not prospecting beneath his sofa cushions for small change for his first spaceflight, he writes technothrillers like *Energized* (powersats), the InterstellarNet adventures of First and Second Contact, and, with Larry Niven, the Fleet of Worlds series of space operas. Ed’s website is www.edwardmlerner.com.

Somebody I Used To Love Asks Me Who Marie Curie Is,

191 words

And that, finally, breaks my heart
although so many potentially
heartbreaking things have already
been said, although I hadn't even known
there was heart left in me to be broken,
but here I am. Because even if we somehow
never-mind those elements she pulled up
from the earth and named as tenderly
as she named her own two daughters,
those gold medals that the French National
Bank refused when she tried to hand
them over to be melted down
for the war efforts of an adopted home,
this was a woman who kept her passion
so tightly at her chest that it turned fatal.
I mean it frankly. This is not a metaphor.
Mme. Curie walked frequently with rods
of radium packed close against her heart
in the pockets of her laboratory dresses,
she slept sometimes with it pillowed
right by her head, decaying alkaline
bonded to decaying woman, until
half a lifetime of exposure killed her.
The story is necessary. It feels unfair
that someone doesn't know, like every
precious gram of burning metal's
been reburied and forgotten,
like Curie was just another
lovesick woman, like everything
is hopeless. I don't know how I got here
I want to say it wasn't real, my misused love,
I want to beg forgiveness from a grave.
I feel like both betrayer and betrayed.
-Carly Rubin



OUR RIGHT, OUR DUTY, OUR PRIVILEGE

GUEST EDITORIAL

Rosemary Claire Smith | 2063 words

Before everyone becomes tired of campaign ads, especially those attack ads we profess to despise but which inescapably influence our voting, let me ask you a question. Would you be willing to work 15 or 16 hours or longer on election day so that your neighbors can vote in person at the polls? What if I told you that our democratic system of government depends on a great many citizens across the United States stepping up to do so, though it means setting aside their regular job and family obligations for the day? Those who serve as Election Officers are volunteers, not employees of either the government or any political party. These are the ones who verify that you are a registered voter, who usher you to the next available voting booth, and who hand you an “I Voted” sticker. They perform other vital tasks that you don’t see. My own experiences as an Election Officer for my community have colored my thinking about our democratic processes.

Election Day begins for me when I arrive at my local elementary school before dawn, at 5:00 a.m. I bring a small cooler with my lunch and some snacks to see me through the day, as there is no time to go out for lunch. In fact, I’m unlikely to see sunshine all day, unless I need to bring a portable voting machine to the curb so that a disabled voter who has been driven to the precinct can vote. If all goes well, and the last voters have finished casting their ballots a little after 7:00 p.m., my colleagues and I turn to the next vital task: we start counting and verifying the ballots recorded by each voting machine for every race, bond issue, constitutional amendment, and what have you. Though we’re weary from the long day, we need to focus on making sure the numbers are recorded correctly and that everything adds up. We usually finish double-checking all counts and certify the results by 9:30 p.m. Nevertheless, we stay as long as necessary to complete the job, which includes securing the voting machines and ballots.

Lest you suppose this is a lucrative gig, in my county, the pay is \$175 for the day’s work. While I haven’t checked extensively, this amount is probably typical of what counties, cities, and other localities can afford. It does not include the two or three hours of required training on setting up, operating, and securing the voting machines, the electronic poll books of registered voters, the paper ballots, and other materials. Nor does it include any time Election Officers spend on their own familiarizing themselves with changes in election laws since the last election.

Although it’s a long day for nominal pay, I’ve found it remarkably rewarding. For example, I recall one time during a midafternoon lull in an off-year election when a woman came in with her daughter, an 18-year-old first-time voter who was as nervous as anything. While I checked the poll book for the young woman’s name and address, she fidgeted, and murmured something about not messing this up. She needn’t have worried, for as it happened that year, voters had the option of using paper ballots—the kind with the ovals next to the candidates’ names that you fill in completely with a pen or pencil; no chads to punch out. Now, if there is anything a suburban 18-year-old knows how to do, it’s filling in this sort of multiple-choice sheet. Then, all she had to do was feed it into the optical scanning machine where it would be counted by the

computer. As she left our precinct with a confident smile, the Election Officers burst into a round of applause.

There's something else that always strikes me around this time of year, namely how many Americans are willing to voice their political opinions in great detail at the drop of a hat. Indeed, at times our social media seems to overflow with political opinions to the detriment of civilized discourse and intra-family harmony. Nevertheless, on balance I think these vociferous exchanges are a good thing. It means that we are not afraid to speak up. No government authorities will come after us or our families in the dead of night because of what we proclaim or write (excepting naturally those who make specific and credible threats of violence). Most of us don't think twice about it. And why wouldn't we take it for granted? After all, we've had many generations of operating under an open democracy.

Now, I'm not saying that things always come off without a hitch in the United States. To be sure, we've witnessed significant problems with paper ballots not all that long ago. Then too, from time to time, we hear about the fraudsters and their attempted dirty tricks. Those are newsworthy in part due to their rarity. Even in those areas of the country where the right to vote came relatively late to some segments of our society, participation may now be higher among those previously precluded from voting than among the rest of the population.

The next time we're standing in a long line to vote, grouching about the "antiquated" technology of today's voting machines, and wishing we could cast our ballots via smart phone instead of going to the polls on a Tuesday, here's something to consider: The ability to cast one's ballot is by no means a routine matter in many parts of the world. Many of us are scarcely aware of just how significant the obstacles are. We don't stop to consider that in April of 1994, when South Africa held its first general elections marking the end of apartheid, the first election in which citizens of all races and ethnicities were permitted to participate, an estimated 20–22 million people stood in lines, some of which stretched for miles, over a two-day voting period. In the run-up to that historic election and during those two days, there were protests, bombings, and loss of life. In some areas, voting had to be extended another day. And yet, democracy did take hold. So important was the first free and fair election that April 27th is now a national holiday in South Africa.

This was by no means the only instance in which people have sought to conduct free, open, and fair elections despite the challenges presented when impoverished villages have no electricity, or when poll workers must bring in paper ballots, ballot boxes, and all the rest of the necessary apparatus via unpaved roads. Everything must be set up, the election conducted, and the ballots securely sealed against tampering before they are transported without mishap to where they are counted and preserved.

It's hardly surprising that initial efforts at democratic elections don't go smoothly when it's a wholly new process for most everyone involved. Democracy is neither intuitive nor innate. It is learned. Growing up in the United States in a small town, I cannot recall when I first learned about voting, though I do know that I took it for granted for many years: Of course the polls would be open all day, and would be situated reasonably close to my home. Of course I would cast a secret ballot. Going to my precinct never involved a calculation as to personal safety. Isn't that just the way it is everywhere?

In a word, no. Several nongovernmental organizations work diligently to promote and build sustainable democracies around the globe. Their efforts entail more than just surmounting logistical and technological challenges, more than working to ensure the integrity of the vote. Frequently, they must begin by educating the electorate and empowering everyone to participate in the electoral process, particularly women, young people, the elderly, those with disabilities, and disadvantaged minorities. The process begins well before election day and continues until the votes are counted and verified in an impartial manner.

There's another significant consideration that I took for granted for way too long, something that was brought home to me one time I served as an Election Officer. I was sitting at the "intake table" where three of us would check in voters. We were using electronic poll books that are essentially laptops rather than those old-fashioned paper printouts where we had to use a ruler to manually draw a line through each voter's name. Hence, the process was quicker than in years past, though we still needed to hand each verified voter a card and to direct them to the lines for the voting machines. Even so, during the lunchtime rush, there was about a fifteenminute wait for voters to reach the front of the check-in line.

I noticed one would-be voter in line, a grim-faced woman "of a certain age" as my older relatives used to say when trying to be polite. She stood out because she was looking all around the school gymnasium as she waited and seemed to grow more apprehensive as she got closer to the head of the line. At first, I wondered if she was having trouble walking or standing. Many voters wait patiently in line notwithstanding physical ailments that are not readily apparent. As a poll worker, I'm trained to assist those with handicaps so that they can exercise their right to vote in a way that preserves the secrecy of their ballot. When it came to be this woman's turn, I smiled and asked for her name, just as I did with everyone. She frowned as she took another long look around the school gym. The fellow behind her raised his head from his cell phone, impatient. I could see the woman coming to some sort of decision just before she recited her name and street address in an accent I couldn't place. I verified she was on the voting rolls and gave her the card she would hand to an Election Officer standing near the voting machines. I pointed out to her the line where people were waiting to vote. She didn't move. Instead, she peered at the voting machines, at the poll workers, at everything. Finally, she said, "Where are the police? I do not see them."

"Police?" I had no idea what she was getting at.

"Yes, the police." She must have seen my look of confusion. At last, suspicion faded from her face and she began to explain. "In my country, the Soviets had police stationed in the polling places. Always, always. To make sure we show up on election day, you see. They watched us. This is my first time to vote here. I became a citizen of the United States this year."

Wow. "We don't have police at the polls," I told her.

The look on her face was incredible as she began to believe me and it dawned on her that nobody—nobody at all—was going to watch her cast her ballot. Nobody was going to make sure she voted the "right way." There would be no consequences for her or her family if she voted her conscience. This woman, who was older than me, had undoubtedly cast a ballot in more elections than I had. Yet, this was the first time she had ever been free to pick whomever she wanted without personal repercussions.

She took the card from my hand and headed toward the voting machines. I didn't see her again, as I needed to focus on checking in the people waiting, and anyway, I wouldn't have wanted her to see me keeping my eye on her.

I think of this new citizen every time I fill out my paper work to serve as an Election Officer. I think of her every time I cast my own ballot. Most especially, I remember her reaction every time I hear or read someone saying that voting doesn't matter or that they're too busy to vote. I think about our fundamental right to have a say in how we are governed. It's my hope that this election year, more citizens will act in accordance with our privilege, our duty, and our fundamental human right.

About the Author:

Rosemary Claire Smith worked as a campaign-finance attorney for the government for over twenty-five years before becoming a full-time author. Her science fiction and fantasy stories have sold to *Analog*, *Fantastic Stories*, *Stupefying Stories*, and elsewhere. They showcase her interests in space exploration, sentient aliens, genetic engineering, folklore, mythology, and especially time travel to the heyday of the dinosaurs. Rosemary has been blogging at rosemaryclairesmith.wordpress.com/blogging-the-mesozoic since 156 million years ago.

IN TIMES TO COME

163 words

This year's April issue has a bit more gravitas than we typically expect this time of year, with mysteries galore. Our lead story is one such: a corpse and an unusual religious practice might be the keys to a larger mystery than anyone is expecting in "Seven Ways of Looking at the Sun Worshippers of Yul-Katan" by Maggie Clark. Then dubious deeds are afoot at a radio show, in Edward M. Lerner's "Soap Opera," and we have Steven L. Burns' story of one cop's fight against his own limitations— and a society rotten beneath the surface—in "Playthings."

Our fact article is a bit outside the norm as well, with Mark C. Childs' look at "Composing Speculative Cities."

Then we have our shorter pieces, such as "Alloprene" by Stephen R. Wilk; "Early Warning" by Martin L. Shoemaker; "Sleep Factory" by Rich Larson; "Most Valuable Player" by Eric Choi; and "Diamond Jim and the Dinosaurs" by Rosemary Claire Smith.

See you in a month! All contents subject to change

GRAVITY WITH 4-VECTOR POTENTIALS—A THEORY REVOLUTION?

THE ALTERNATE VIEW

John G. Cramer | 1844 words

Albert Einstein's general theory of relativity (GR), which describes gravitational forces as arising from the mass-induced curvature of space, had its one hundred-year anniversary in 2015 and is still going strong as our standard model of gravitation. Over the century, it has successfully passed a series of critical tests and demonstrated its superiority over rival theories of gravity. Now another test involving gravitational waves is coming, and there is a significant chance that GR may not survive this one.

Professor Carver Mead is Gordon and Betty Moore Professor Emeritus of Engineering and Applied Science at Caltech. He is the person who named Moore's Law and demonstrated mathematically and experimentally that transistors and other integrated circuit elements actually work better and faster when they are made smaller, blazing the trail that has led to the microelectronics revolution. Mead has developed a simpler approach to gravitation (G4v) that employs a gravitational 4-vector potential. G4v makes much the same predictions as GR, but it predicts behavior for gravitational waves that is qualitatively different from that of GR. The NSF's Advanced LIGO gravitational wave detector system, four-kilometer-long L-shaped interferometers located at sites in Hanford, Washington and Livingston, Louisiana, is expected to soon detect gravitational waves from merging neutron stars or black holes. Such detection is a make-or-break test that should falsify either GR or G4v (or both).

Mead's new approach is based on his unusual book, *Collective Electrodynamics*, which breaks the orthodoxy of textbooks about electricity and magnetism (E&M) by *starting* with superconductors involving electrons acting collectively, instead of the usual approach that starts with individual electric charges acting in isolation. He has formulated this alternative approach to electrodynamics, and he brings in the quantum mechanics of collective systems (like superconductors) in a very natural way. It is a simple and straightforward (if disorienting) approach and represents essentially an alternative to conventional quantum electrodynamics, our standard model of electromagnetic phenomena at the quantum scale.

In E&M theory there are two ways of looking at interactions and forces between charges: (1) as resulting from the electric E and magnetic B fields that exert forces on at-rest and moving charged particles, and (2) as resulting from the electric scalar potential and the magnetic vector potential that directly modify the momentum of charged particles. Mead ignores the E and B fields and their forces and combines the scalar and vector potentials into a 4-vector potential, with the magnetic vector potential as the space-like parts and the electric scalar potential as the time-like part. He uses this 4-potential approach to get many familiar results in an interestingly unfamiliar and simple way.

In addition, in his book *Collective Electrodynamics*, Mead presents an important calculation that I have seen nowhere else. There is a fundamental problem with the standard theory of quantum mechanics, in that it uses the mechanism of "wave-function collapse," an abrupt change in a quantum wave function whenever a measurement is made or a quantum event occurs.

However, the standard quantum formalism does *not* provide mathematics describing such a collapse. Mead fills this gap, at least in part. He uses his 4-potential formalism along with standard quantum mechanics to describe a “quantum jump,” a quantum event in which an atom in its excited state delivers a photon to an identical atom in its ground state.

This process was the center of a controversy between Neils Bohr and Erwin Schrödinger, in which Schrödinger refused to believe that quantum jump could be “instantaneous,” as Bohr insisted they must be. Mead resolves this difficulty. He employs the exchange of advanced and retarded waves from my own transactional interpretation of quantum mechanics. He assumes that the initial positive-energy retarded wave from an excited atom *A*, interacting with some ground-state atom *B*, perturbs *B* into a mixed state that adds a very small component of excited-state wave function to its ground-state wave function. Similarly, a negative-energy advanced wave from atom *B*, interacting with atom *A*, perturbs it into a mixed state that adds a very small component of ground-state wave function to its excited-state wave function. Because of these added components, both atoms develop small time-dependent dipole moments, tiny antennas that oscillate with the same beat frequency because of the mixed-energy states and act as coupled dipole resonators. The phasing of their resulting waves is such that energy is transferred from *A* to *B* at a rate that initially rises exponentially.

To quote Mead: “The energy transferred from one atom to another causes an increase in the minority state of the superposition, thus increasing the dipole moment of both states and increasing the coupling and, hence, the rate of energy transfer. This self-reinforcing behavior gives the transition its initial exponential character.” In other words, he has shown mathematically that the perturbations induced by the initial advanced/retarded exchange triggers the formation of a full-blown quantum jump in which a photonworth of energy is transferred from one atom to the other. This is the long-sought mathematical description of quantum wave function collapse.

Mead has recently gone beyond this triumph in quantum physics by extending his 4-vector potential formalism to gravitation as well as electromagnetism, producing G4v. This is a theory that is still being developed, but it promises to provide the key to the long-sought problem of unifying gravitation and quantum mechanics. This approach to gravity theory was nearly realized by Einstein himself in a 1912 paper published in an obscure medical journal and largely ignored, but Einstein subsequently turned in a different direction in his 1915 formulation of general relativity.

Mead’s four-vector gravitation gives predictions that are indistinguishable from those of Einstein’s general relativity for most of the well-known GR tests. These include the gravitational deflection of light, the perihelion shift of the orbit of Mercury, the gravitational red shift, the frame-dragging effects of Gravity Probe B, and the rate of gravitational-wave energy loss from neutron-star binary pulsars.

However, when attention is turned to the production and detection of gravitational waves, there is an important difference. In considering a binary star system with two masses rotating in circular or elliptical orbits, both theories predict radiation at twice the rotation frequency of the binary source, but the G4v theory and GR theory predict qualitatively different angular dependence of gravitational wave emission and different behavior of

gravitational wave “antennas” like LIGO in detecting such waves. In particular, if the binary star system rotates in a certain plane, GR predicts that the emission of gravitational waves has a maximum along the axis perpendicular to that plane, while G4v predicts that the emission is maximum in directions that see the plane of rotation edgewise.

Why this difference? The gravitational waves predicted by GR have squeeze-stretch tensor polarization, with the two polarization modes denoted by “+” and “ \times ” indicating that the squeeze-stretch of space is aligned either with the vertical/horizontal axes or with the diagonal/anti-diagonal axes perpendicular to the direction of motion of the wave. On the other hand, the gravitational waves predicted by G4v have more normal vector polarization, with the two polarization modes denoted by “ \parallel ” and “ \perp ” indicating vectors in the θ or inclination direction or in the ϕ direction perpendicular to inclination, both perpendicular to the direction of motion of the wave. The GR waves have roughly equal intensities in the two polarizations modes, while for the G4v waves the “ \perp ” polarization is dominant.

The GR gravitational waves are traveling distortions of space, and for a binary star system they add to a maximum pointing perpendicular to the orbit plane. The G4v waves from the two members of the binary system are vectors that tend to cancel when they travel the same distance because the source stars are moving in opposite directions, so their maximum intensity comes when there is a large phase difference between them due to the distance difference from the two source stars to the observer. This occurs when the orbit plane is edgewise to the observer.

There is also a significant difference in the way an interferometric gravitational wave detector like Advanced LIGO should respond to the gravitational waves predicted by the two theories. The stretch-squeeze tensor gravitational waves of GR should modify the distances between interferometer mirrors in the LIGO arms, producing a characteristic signature template that the LIGO data-analysis software is designed to extract from the incoming data. In contrast, the perpendicular component of the gravitational waves of G4v should directly modify the momentum of the interferometer mirrors, causing them to move and to shift the interference pattern. This produces a qualitatively different signature template that the LIGO data-analysis software must be designed to extract from the incoming data. Thus, the response of Advanced LIGO to the gravitational waves predicted by the two theories will be quite different, and the data analysis software must be on the lookout for waves of either type. Fortunately, the scientists operating Advanced LIGO are aware of this dichotomy, and they are prepared to detect either type of gravitational waves.

Thus a critical make-or break test of GR vs. G4v is waiting for the arrival of the first detectable gravitational waves in the improved Advanced LIGO detector system. The first data run with the new system is planned for the fall of 2015, and by the time you read this, the system may have detected its first gravitational waves.

What would be the consequences if Advanced LIGO should definitively detect gravitational waves of the type that is predicted by G4v? It would herald nothing less than a major revolution in theoretical physics. Einstein’s general theory of relativity, with its treatment of gravitational forces as arising from

space curvature, would be falsified. Black holes would become simply ultra-degenerate compact stars, with no singularity, naked or otherwise, lying in wait at the bottom of the gravity well. There would be no dark energy, because G4v explains the dimming of distant receding Type IIa supernovas as partially due to relativistic beaming, without the need for a non-zero cosmological constant.

Further, the approach of quantum field theory, with its churning vacuum full of virtual particle, would be called into question by the G4v approach to fundamental interactions. This would resolve a problem created by quantum field theory, which predicts an energy density of the quantum vacuum that is 10^{120} times larger than its actual value. Moreover, the work on developing a unified theory that unites quantum mechanics and gravity would be set on a much smoother path that should lead to a solution to that vexing problem.

So, are we on the cusp of a major gamechanging revolution in theoretical physics? Will the current standard models of gravity and particle interactions survive this critical test or will they be overthrown? Watch this column for future developments. * * *

John Cramer's new book describing his Transactional Interpretation of quantum mechanics, *The Quantum Handshake—Entanglement, Nonlocality, and Transactions*, (Springer, January 2016) is available online as a printed or eBook at: <http://www.springer.com/gp/book/9783319246406>. SF Novels by John Cramer: my hard SF novels, *Twistor* and *Einstein's Bridge*, are available as eBooks from the Book View Café coop at: <http://bookviewcafe.com/bookstore/?s=Cramer>.

Alternate View Columns Online: Electronic reprints of over 178 "The Alternate View" columns by John G. Cramer, previously published in *Analog*, are available online at: <http://www.npl.washington.edu/av>.

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THE REFERENCE LIBRARY

Don Sakers | 2179 words

When Samuel R. Delany talks about the differences between science fiction and mundane fiction, he calls attention to the way language can have extra layers of meaning in SF. As an example, he gives the statement, “Her world exploded.” In mundane fiction this is a metaphor for emotional distress; in SF the same statement could also be literally true—a planet belonging to a woman may very well have disintegrated.

This example says a lot about science fiction, because we *do* love destroying worlds... particularly the world.

There are two types of SF about the end of the world. One type, extremely popular today, is post-apocalyptic SF: stories set some time after the end of the world. In post-apocalyptic SF, the Great Disaster (or the Time of Troubles, or the Crash, or whatever) happened long enough ago that it’s the subject of legend rather than recent memory. Much of the time, the exact nature of the disaster is unknown or irrelevant.

The other type, which I’m concerned with here, is set before, during and/or slightly after the end. Disaster movies on steroids, these stories focus on the specific threat and the impact it has on people and societies.

If we leave out Ragnarok, the Kali Yuga, Gilgamesh, the flood, Revelations, and other theological apocalypses, then it all began—as it so often did—with Edgar Allan Poe. In 1839 he published “The Conversation of Eiros and Charmion,” in which a close encounter with a comet poisons Earth’s atmosphere. (In 1913, Arthur Conan Doyle’s Professor Challenger faced the same problem, *sans* comet.) For a while, cosmic collisions were the leading candidate for the end of the world, as a variety of passing objects threatened to destroy Earth: a passing star in H. G.

Wells’s “The Star” (1897); the Moon in “The Death of the Moon” (Alexander M. Phillips, 1929) and *Moonfall* (Jack McDevitt, 1998); alien planets (*When Worlds Collide* by Philip Wylie & Edwin Balmer, 1932, and *The Wanderer* by Fritz Leiber, 1964); a comet again in Larry Niven & Jerry Pournelle’s *Lucifer’s Hammer*; and (more recently) asteroids in everything from 1998’s twin movies *Deep Impact* and *Armageddon* to Adam Roberts’s 2007 novel *Splinter*.

Disaster can also come from misbehavior by the Sun. Before we had a full understanding of stellar evolution, the Sun frequently went nova, as in Arthur C. Clarke’s 1946 novelette “Rescue Party,” Richard Matheson’s 1953 story “The Last Day,” and two tales from 1954, Alfred Coppel’s “Last Night of Summer” and J. T. McIntosh’s *One in 300*. A freezing Earth, either from reduced solar radiation or changing orbits, featured in Fritz Leiber’s 1951 classic “A Pail of Air” and the *Twilight Zone* episode “Midnight Sun” (1961). And in Edmund Cooper’s *All Fool’s Day* (1966), the Sun started spewing out wavelengths that drive ordinary folks to “radiant suicide,” leaving only psychopaths to inherit the Earth.

Worldwide floods and other geological disasters had a brief popularity, in tales like *The Second Deluge* (Garrett P. Serviss, 1911), *The Deluge* (S. Fowler Wright, 1928), *The Drowned World* (J. G. Ballard, 1962), and Murray Leinster’s 1920 masterpiece “The Mad Planet.”

In the postwar period, atomic war was all the rage. (Actually, H. G. Wells set the stage in 1914 with *The World Set Free*, but after Hiroshima SF went on an atomic war bender.) Although most tales were more properly post-apocalyptic

stories, some stories took place before, during, and immediately after the war. Notable among them were “Atom War” by Rog Phillips (1946), “Thunder and Roses” by Theodore Sturgeon (1947), Peter George’s novel *Red Alert* (1958), which was the basis for the 1963 movie *Dr. Strangelove*, and the 1983 TV miniseries *The Day After*.

Ecological disasters, including plagues, have been a popular way to end the world since Mary Shelley’s *The Last Man* (1826). Sometimes it was other lifeforms running amuck, as in H. G. Wells’s “The Empire of the Ants,” (1905), David H. Keller’s *The Ivy War* (1930), Ward Moore’s *Greener Than You Think* (1946), John Wyndham’s classic *The Day of the Triffids* (1950), or Thomas M. Disch’s *The Genocides* (1965). More often than not, especially in the 1960s and ’70s, the end came through pollution and other human-caused disasters: “Adam and No Eve” by Alfred Bester (1941), *The Death of Grass* by John Christopher (1956), and John Brunner’s *The Sheep Look Up* (1972).

Climate change, the current best bet for ending the world, has a long history in SF, in such titles as *The Purchase of the North Pole* (Jules Verne, 1889), *When the Tides Went Out* (Charles Eric Maine, 1958), *The Burning World* (J. G. Ballard, 1964), and more recently, much of the work of Kim Stanley Robinson.

Then there are those works that end the world in less usual ways. In Eando Binder’s 1937 story “Life Disinherited,” Jupiter’s Great Red Spot peels off into space and collides with Earth. *Childhood’s End* by Arthur C. Clarke (1953) sees Earth destroyed through collateral damage during the ascent of humanity’s successors. And in Douglas Adams’s *Hitchhiker’s Guide to the Galaxy* (1978), Earth is famously demolished to make way for a hyperspace bypass.

Finally, there are authors who set their sights a bit higher, destroying not just a planet but the entire Universe. Notable classics are Nat Schachner’s “Beyond Infinity,” (1937), “The Nine Billion Names of God” (Arthur C. Clarke, 1953), James Blish’s *The Triumph of Time* (1958), and Michael Moorcock’s “Last Vigil” (1970).

Which brings us to:

***Death Wave* Ben Bova Tor, 416 pages, \$25.99 (hardcover) iBooks, Kindle, Nook: \$12.99 (e-book) ISBN: 978-0-7653-7950-4 Series: New Earth 2, Grand Tour 22 Genres: End of the World, Psychological/Sociological SF**

In 2014’s *New Earth*, Jordan Kell led an expedition to a newly-discovered habitable planet orbiting Sirius. The journey took eighty years, with the crew in suspended animation. Once there, they discovered that the planet was a construct of The Predecessors: an ancient, long-departed alien race—a construct with a biosphere seeded with DNA taken from Earth.

An AI left behind by the Predecessors warns of approaching disaster. Nearly thirty thousand years ago, there was a massive gamma ray burst at the center of our galaxy. The wavefront of that burst—a Death Wave—is two thousand lightyears from Earth and approaching at the speed of light. When it arrives, all life on Earth will be extinguished.

With Aditi, one of the Earth-derived native humans of New Earth, Pell and his crew return home to warn the human race.

In the nearly two centuries they’ve been gone, Earth has changed. Additional rounds of global warming have resulted in more flooding, a new World Council rules with an iron fist, and nanotechnology is outlawed.

What follows is the story of Kell's struggle to convince a reluctant world of the seriousness of the Death Wave threat. Somewhere in the lost technology of the Predecessors is the secret of faster-than-light travel—but will humanity take action in time? Ben Bova is an old hand at this intersection of politics and sociology with technology and science, and he makes the story fascinating.

Incidentally, if this notion of a wave of death approaching from the galaxy's center sounds familiar, you're probably remembering Larry Niven's Known Space series; in his 1966 story "At the Core," I believe he was the first to make this speculation.

***InterstellarNet: Enigma* Edward M. Lerner FoxAcre, 316 pages, \$15.95 (tpb) iBooks, Kindle, Nook: \$7.99 (e-book) ISBN: 978-1-19367-7164-6 Series: InterstellarNet 3 Genres: Alien Beings, Space Opera**

I'm not going to spend a lot of time on this one, because much of the contents appeared as short fiction in these pages (notably "The Matthews Conundrum" in November 2013 and "Championship B'tok" in September 2014). You already know that Edward M. Lerner is the quintessential *Analog* writer, combining well-researched scientific and technological speculation with compelling characters and thought-provoking plots. If you've read the two previous InterstellarNet books (*Origins* and *New Order*, both 2010), then you don't need me to tell you how satisfying this series is.

If you've not had the pleasure, you have waiting for you a unique interstellar society of humans and some really cool aliens; an answer to the Fermi Paradox; philosophical questions of identity, power, and the place of humanity in the universe; and now some temporal travel thrown into the mix.

InterstellarNet: Enigma contains some pieces that you haven't seen before; it's well worth the price even if you have all the *Analog* stories already.

***Little Dystopias* Kyle Aisteach Lightning Cellar, 240 pages, \$25.00 (hardcover) iBooks, Kindle, Nook: \$6.99 (e-book) ISBN: 978-1-943305-00-1 Genres: Short Fiction Collections**

Kyle Aisteach is a fairly new name in science fiction. He published his first story in 2010 and since then he's been churning out little gems of hard SF. *Little Dystopias* collects 17 of those gems, each with a delightful introductory essay discussing the genesis of the story idea, research methods, and anything else on the author's wide-ranging mind.

Despite the title, not all of these stories are dystopian. However, most of them are, in the very best sense, unsettling. They're thoughtprovoking in that particular way in which you find your thoughts returning to them days and weeks later.

"The Survivors Menagerie," for example, is based on the idea of an historical research facility in the far future that rescues doomed people from history's great disasters in order to use them as the ultimate primary sources. "Eternity Undone" examines the SF trope of uploading consciousness into cyberspace, and what happens when the process doesn't work the way we assume it will.

“Ward and Protector” questions our assumption that artificial intelligence is superior to the biological kind.

Aisteach’s story introductions provide an intelligent meta-commentary on the stories, adding another layer of meaning to tales that already go beyond the ordinary.

Twelve Tomorrows: MIT Technology Review SF Annual 2016 **edited by Bruce Sterling** Technology Review, Inc, 229 pages, \$14.95 (trade paperback) iBooks, Kindle: \$9.99 (e-book) Genres: Hard SF, Original Anthologies

Periodically, the MIT Technology Review publishes an issue full of science fiction stories based on new and emerging technologies. In a way, each volume is like an extra issue of *Analog* in the year it’s published—the stories are the same kind of science-based, thought-provoking works you find in this magazine.

This year there are 11 stories by 11 authors, plus a picture gallery featuring the work of legendary SF artist Virgil Finlay. Some of the authors are familiar names in SF circles: John Kessel, Bruce Sterling (who also edits), and Charles Stross. Among the others are Paolo Antonelli, senior curator of architecture & design at the Museum of Modern Art; Ilona Gaynor, London-based artist, writer, and filmmaker; Annalee Newitz, editor in chief at *Gizmodo.com* and author of *Scatter, Adapt, and Remember*; Pepe Rojo, Mexican scholar of fiction, media, and contemporary culture; and Daniel Suarez, bestselling author and prolific speaker on technology. A couple of internationally-known writers fill out the roster.

For me, the standout story is Bruce Sterling’s “The Ancient Engineer,” which tells the origin of the Antikythera mechanism. Jo Lindsay Walton’s “The Internet of Things Your Mother Never Told You About” is both a cautionary tale and a tour de force. And Ted Beauman’s “It Takes More Muscles to Frown” is a bittersweet tale involving emotion-detection software.

If you enjoy reading *Analog*, you’ll enjoy this anthology. It’s as simple as that.

A Palazzo in the Stars **Paul Di Filippo** Wildside, 260 pages, \$14.99 (trade paperback) ISBN: 978-1-4794-0714-9 Genres: Short Fiction Collections

Paul Di Filippo has been publishing in the field since 1977. He’s a master of short fiction, known for an offbeat sense of humor and a delightfully skewed way of looking at everything. His best-known work is *The Steampunk Trilogy* (1995), a collection of three novellas ringing steampunk changes on the Victorian era.

A Palazzo in the Stars is a collection of 17 recent works (from 2010 to 2013), and if you’ve never encountered Di Filippo [see his story in the November 2013 *Analog*] this is a fantastic place to start.

It starts with “A Galaxy of Mirrors,” an amusing and all-too-plausible explanation for Fermi’s Paradox. “Farmearth,” in the writer’s own words, is “a story of how a bunch of future kids nearly destroyed the ecosphere. All from

their bedrooms!" Perhaps my favorite is "Sweet Spots," a tale of what can only be called applied synchronicity.

One of the many reasons to read science fiction is that it can be just plain fun. If you want some just-plain-fun stories, *A Palazzo in the Stars* is the volume you've been looking for.

***Mission: Tomorrow* edited by Bryan Thomas Schmidt Baen, 325 pages, \$15.00 (trade paperback) ISBN: 978-1-4767-8094-8 iBooks, Kindle: \$8.99 (e-book)
Genres: Original Anthologies**

I think *Analog* readers as a whole want to see the human race expand into space. I think the vast majority of us hold NASA dear in our hearts, and truly wish it to succeed—but it's fair to ask what the future of space exploration would look like without NASA. That's what the 18 authors in *Mission: Tomorrow* have done.

Seventeen of these stories are new—the one exception is Robert Silverberg's 1957 story "Sunrise on Mercury." The authors include Ben Bova, Michael Capobianco, Michael F. Flynn, James Gunn, Sarah A. Hoyt, and Jack McDevitt, along with a host of lessfamiliar names.

There's a lot of variety here. You won't want to miss "A Walkabout Amongst the Stars" by Lezli Robyn, in which Australian astronauts encounter *Voyager I*; Michael F. Flynn's "In Panic Town, on the Backward Moon," a murder mystery set on Mars; and Brenda Cooper's "Iron Pegasus," a tale of a rogue robot that echoes Isaac Asimov's Powell and Donovan stories.

All things considered, *Mission: Tomorrow* is a nice, meaty anthology of space travel tales that has something for everyone.

And with that, my space is filled. Barring the end of the world, I'll be back next issue.

Don Sakers is the author of *Meat and Machine* and *Elevenes*. For more information, visit www.scatteredworlds.com.

If my doctor told me I had only six minutes to live, I wouldn't brood. I'd type a little faster.

—Isaac Asimov

BRASS TACKS

1299 words

Trevor,

This is for Bill Seiler (Brass Tacks, October 2015): The first issue of *Astounding Stories* is available online, for free download, at The Gutenberg Project. Just query under "*Astounding Stories*." You wouldn't have wanted to reprint "The Beetle Horde;" it's a twopart serial! Gutenberg apparently has most of 1930 and 1931, plus a number of individual items that appeared in *Astounding*, many with the original covers.

Read and enjoy... Rob Chilson

Dear Editors,

I just finished reading the October 2015 Alternate View by John Cramer. What a bunch of CRAP! He needs to be awarded his own AARSE award for continuing to believe that "global warming" is either true or manmade! Every once in a while you publish an article (fact or fiction) that betrays your hidden agenda regarding "settled science of global warming" without looking at previously published information in your own magazine, or publicly available information! We are currently in a cooling cycle driven by a lack of sunspots, which may rival the "little Ice Age" when the Thames froze over. I don't know about other people, but I am preparing for substantially colder weather on a global basis for the next twenty to thirty years, including moving to either Texas or Florida, and becoming substantially more independent of the current infrastructure (energy, food, transportation). I recently renewed my subscription for three years, but if the editorial staff continues to publish "this agenda," I will not be renewing in the future.

Lee Hansen Rensselaer, NY

Lee,

I hope you'll stick around, not simply because editors always hate to lose subscribers, but because I'm very aware of the number of valuable contributions you, personally, have made to Brass Tacks over the years.

But I have to point out that we received letters both from folks het up about John Cramer's column and from folks bothered by Arlan Andrews' column the month prior, which takes the opposite position. If you feel that qualifies as publishing "an agenda," there's not much I can do about it, other than only publishing the side you agree with, which just isn't gonna happen; it's not what this magazine is about.

That said, if you've noticed fewer letters on the subject in Brass Tacks, you'd be right. The bar for broaching the topic is especially high these days, because I remember months during which climate change was the only topic people talked about in the column, and frankly, the back and forth became interminable. I'm not interested in rehashing discussions we've already had here, unless something new and particularly interesting arises.

Dear Mr. Quachri,

I have been a subscriber since 1975, but this is the first time I have written. There are a number of issues concerning the content of your excellent publication on which I would like to comment:

1. Editorials: Firstly, I entirely agree with the letter from Mr. Quittner in the

current issue (October) that it would be good to hear more from you. I used to very much enjoy Dr. Schmidt's musings, and as a Brit it gave me a useful insight into matters of wider social significance in the U.S., which I only otherwise get from watching "The Daily Show." I have no objection per se to Guest Editorials, but I do draw the line at those such as the article by Dr. Kanas in the current issue. While I would not gainsay that he is making a useful contribution to the field of genre history (in an educational style not dissimilar to Don Sakers' Reference Library), there is no way one could consider his piece to be an editorial (definition: (n) "an article expressing the editor's opinion on a topical issue") unless he is saving all his opinions for the second part!

2. The Alternate View: I see from the September issue that the "Guest Contributor" concept has also spilled over into the Alternate View, and I welcome your suggested gathering of reader feedback to determine the future structure of this section. Clearly there is some ambiguity in the title, as it can be taken to mean either alternating, or alternative. Some definition may be needed here also, and fortunately help is at hand, as I have a copy of the May 1979 *Analog* in which the first Alternate View appeared, and above which Stan Schmidt had appended the note "herewith begins a new department, wherein G Harry Stine and Jerry Pournelle take turns reporting on very late developments in science and technology." It seems clear that the original "mission statement" was for a rotation of contributors, but as time has passed and contributors changed, the situation has been reached where it is unclear what differentiates the AV column from the Science Fact articles (apart from the length). This situation is not helped when you publish other factual articles masquerading as editorials! So perhaps you should consider modifying the title to the Alternative View, and making it a forum for opinions that challenge mainstream thinking on topical issues. This would present an ideal opportunity for guest contributors; Arlan Andrews Sr. set just this sort of tone in his September piece.

3. New Contributors: There has been a welcome influx of new writers over recent months, but their names usually appear entirely unheralded. I counted three in the latest issue, yet Richard Lovett's Biolog is of Joe Pitkin, making his third appearance, and he usually profiles established authors. Is it not possible to at least attach a brief biographical note to the story to indicate how the new talent has come to light, in much the same way as you have recently introduced a preamble to those stories which are linked to previous ones by the same author?

4. The Contents Page: Finally, on a perhaps more controversial note, could I lodge a plea for consideration being given to changing the format of the contents page?

Instead of the "functional" headings indicating the length of each piece, would it not aid readers more if you instead identified the material under well-recognized sub-genre headings (i.e. Space Opera, Alternate History, Hard SF, etc.)? This would not preclude the stories retaining their Short Story/Novella categorizations for awards purposes, etc. Don Sakers has already adopted the practice in his reviews column. I would be interested to learn other readers' views on this. Do they, for instance, (as I used to) always read all the short stories first, then the novelettes, etc., regardless of the content?

Best wishes & thanks for a great mag. Ian McBain London, UK

Mr. McBain,

Since your thoughtful letter is so nicely organized, allow me to do the same:

1. Right you (and Mr. Quittner) are. Guest Editorials were never intended to be the norm, but alas, the best laid plans of mice and men so on and so forth. However, the current spate of them isn't going to be the case forever, either. We're discussing some alternatives (which require a bit of layout adjustment), but as I've learned repeatedly, I shouldn't promise anything.

2. I think you're right about the value of differentiating the AV from fact articles (as well as Guest Editorials). Finding a rotating line-up of contributors is rather time consuming, so we're pretty definitely going to settle on a pair of columnists, but those contributors will necessarily have pretty distinct approaches. John Cramer does his job very well, but we don't need two of him.

3. Well, page space will always be at a premium, and I don't want to cannibalize any material Richard A. Lovett might use in a Biolog, but I won't rule out the idea.

4. This is interesting. It would really be next to impossible to list stories by genre, since everyone thinks their personal categorizations are immutable laws of the Universe, and many stories simply aren't neat fits for one genre or another. But I'd be interested in hearing from other readers if they can think of any other criteria that might be worth adding to the table of contents, in addition to the story length.

UPCOMING EVENTS

Anthony Lewis | 400 words

NOTE: Membership rates and other details often change after we have gone to press. In addition, most conventions have age-based membership rates in advance and at the door. There also may be rates for single days. Check the websites for the most recent information.

26–28 February 2016

MYSTICON (Roanoke area SF conference) at Holiday Inn Tanglewood, Roanoke VA. Convention GoH George R. R. Martin, Artist GoH J P Targete, Gaming GoH John Watts, Music GoH Bella Morte, Fan GoH Linda Shuping Smith, MC Rich Sigfrit. Info: www.mysticonva.com.

4–6 March 2016

ALBACON 2016 (NY Capitol District SF&F conference) at Best Western Albany Airport Inn, Albany NY. Writer GoH David Weber, Artist GoH Heidi Hooper. Info: www.albacon.org/2016/.

18–20 March 2016

LUNACON 2016 (NYC SF&F conference) at The Hilton Westchester, Rye Brook, NY. Guests of Honor: Robert J. Sawyer, Rick Sternbach, Naomi Novik. Info: www.2016.lunacon.org; Lunacon 2016, PO Box 3137, New York, NY 10163-3137.

24–27 March 2016

NORWESCON 39 (Pacific Northwest F&SF conference) at Double Tree by Hilton Seattle Airport, SeaTac WA. Author GoH Tanya Huff, Artist GoH Janny Wurts, Science GoH William Hartmann, Spotlight Publisher DAW (Sheila Gilbert & Betsy Wollheim). Info: www.norwescon.org; info@norwescon.org.

25–27 March 2016

MINNICON 51 (Minneapolis area SF&F conference) at hotel to be determined—check the website. Author GoH Seanan McGuire, Artist GoH Sara Butcher Burrier. Info: mnstf.org/minicon51; Lake Street Station, PO Box 8297, Minneapolis MN 55408-0297.

17–21 August 2016

MIDAMERICON 2 (74th World Science Fiction Convention) at Kansas City Convention Center and Bartle Hall, Kansas City, MO. Guests of Honor: Kinuko Y. Kraft, Patrick and Teresa Nielsen Hayden, Tamora Pierce, Michael Swanwick.

TM: Pat Cadigan. Membership: currently. Attending \$150 (adult), \$90 (young adult, up to 25), \$60 (child 5–15); \$50 supporting. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Nominate and vote for the Hugos. Info: <http://midamericon2.org/>; info@midamericon2.org.

28 February–2 March 2016

TENNESSEE VALLEY INTERSTELLAR WORKSHOP 2016 (Southeastern space conference) at Chattanooga Choo-Choo hotel, Chattanooga TN. Emcee: Les Johnson; Authors: Jim & Greg Benford, Tedd Roberts; Scientists: Greg Matloff; Kelvin Long; Literary: Paul Gilster, Toni Weisskopf. Admission: Adult (18+) \$125 until 01 December; \$175 until 15 February 2016; \$225 thereafter; Post-secondary: 50% off. Info: www.tviw.us/event/tviw-2016; rain.glynn@tviw.us.

Attending a convention? When calling conventions for information, do not call collect and do not call too late in the evening. It is best to include a S.A.S.E. when requesting information; include an International Reply Coupon if the convention is in a different country.

Information

344 words

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