

Absolute Magnitude



Science Fiction

Winter 1999

Issue #12

Hal
Clement

Novella by the
Lowest Grand Master

Sharon Lee
and
Steve Miller

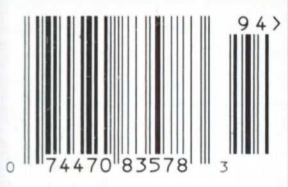
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Editorial Notes by Warren Lapine

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First off, I'd like to welcome all of our new readers. Our recent subscription drive was very successful and a lot of you are reading *Absolute Magnitude* for the first time. We'd also like to congratulate one of our regular contributors, Hal Clement, for his recent Grand Master Award. The Grand Master Award is the most prestigious award that science fiction has and it is not bestowed lightly. To help Hal celebrate this achievement we're making this our special Grand Master issue. We've added an extra thirty two pages so that we could bring you a new Hal Clement novella and an interview with another Grand Master, Jack Williamson.

Hal Clement holds a special place for us here at DNA Publications. He was the first established author to take a chance on us back when we'd put out only one issue of our first magazine. Not only did he write a story for us, but he wrote four interconnected stories that we ran over the course of a year. Those stories have recently been combined by Tor Books into the novel *Half Life*. If you don't already have the book, go out and get a copy, you won't be disappointed. It's an excellent book.

Some of you may have heard the sad news by now. Gene KoKayKo, another of our regular contributors, passed away. He appeared in *Absolute Magnitude* five times and was a genuinely nice guy. I'll miss talking with him and reading new stories by him. During the same month, my father, Donald Lapine also passed away. This has been a sad season for us here at DNA Publications as a result of these passings.

This issue is dedicated to the memory of
Gene KoKayKo and Donald Lapine

Absolute Magnitude

Science Fiction

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D.E.H.'99

A Choice of Weapons

by Sharon Lee and Steven Miller

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The number of High Houses is precisely fifty.

And then there is Korval.

—From the *Annual Census of Clans*
On file with the Council of Clans, Solcintra, Liad

66 I am not worthy.”

Daav yos’Phelium bowed low. When he straightened, it was not to his full height, but with carefully rounded shoulders and half-averted face: A lesser being, faint with terror at his own audacity.

His mother would have laughed aloud at such obvious mummery. His delm—Korval Herself, she who held the future and life of each clanmember in her sedately folded hands—merely lifted an elegant golden eyebrow.

Daav schooled himself to stillness—small challenge for one who was a Scout—face yet averted. He did not quite bite his lip, though the inclination was strong. Not all of his present display was artifice; it was no inconsiderable thing to bring Korval’s Own Eye upon oneself, true-son though he be.

A full Standard minute passed before Korval shifted slightly in her chair.

“In the one face,” she said, reflectively, and in no higher mode than that of parent to child, “the question of how long you might stand there, cowed and silent, beguiles my closest interest. On the other face, it is *Daav* before me, and one cannot be certain but that this is a ploy engineered to rob us both of the pleasure of attending Etgora’s certain-to-be-tedious evening gather.” The mode shifted, and she was his delm once more, chin up and eyes no warmer than ice.

“Elucidate this sudden unworthiness.” The eyebrow lifted again. “Briefly.”

Mode required that a petitioner accept the Delm’s Word with a bow. Daav did so, forehead brushing knees, and returned to the round-shouldered pose of inferiority.

“I have today received my quartershare accounting from dea’Gauss and with it certain documents needful of my attention. One of those documents was the Delm’s Formal Declaration of Heir, in which I discover myself named Korval-in-future.” He moved his shoulders, easing tension that was born not only of the unnatural posture.

“The information amazes?” Korval-in-present inquired. “Surely you are aware that you have been trained for the duty since you had sense of language.”

Daav inclined his head. “But I was not trained alone. Er Thom has been at my side, schooled as I was, word and gesture. We studied the same diary entries. We learned our equations at the same board. All in accordance with Delm’s Wisdom—that two be conceived and trained to the duty, to insure that Korval *would* have its delm, though yos’Phelium’s genes twice proved inadequate.”

He paused, daring a quick glance at his delm’s face from beneath modestly lowered lashes. No sign—of irritation, impatience, boredom. Or humor. Chi yos’Phelium had been a Scout herself before duty called her to delmhood, forty Standard years ago. *Her* face would reveal whatever she wished to show.

“Er Thom,” Daav murmured, “has a steady nature; his understanding of our history and our present necessities is entirely sound. Of course, he is a master pilot—indeed, his skill over-reaches my—”

Korval raised her hand.

“A discussion of your foster-brother’s excellencies is extraneous to the topic.” She lowered her hand. “Daav yos’Phelium professes himself unworthy to assume the duty he was bred and trained for, thus calling a Delm’s Decision into question—that is your chosen theme. Speak to it.”

Daav took a deep breath, bowed. She was correct—of course she was correct. A Delm could not be wrong, in matters of Clan. That the Delm had mis-chosen her heir was no fault of her judgement, but his own error, in withholding information she required. He had intended to speak ere she had chosen, but he had not expected her to have chosen so soon.

He came to his full height and met his delm’s chill eyes squarely.

“Perhaps, then, I should have put it that I am unfit for the duty. While I am off Liad, performing even the most tedious of tasks required by Scout Headquarters, my temper is serene and my judgement sound. I am scarcely a day on the homeworld and I am awash in anger. People annoy me to the edge of endurance. Mode and measure grate my patience. I cannot say with any certainty that my judgement is sound. Indeed, I fear it is dangerously unsound.” He bowed again, buying time, for this next was difficult, for all it needed to be said.

“I had been to the Healers, last leave, and asked that the distemper be mended.”

“Ah,” said Korval. “And was it so?”

Daav felt his lips twitch toward a smile—most inappropriate when one was in conversation with one’s delm—and straightened them with an effort.

“Master Healer Kestra,” he said, “was pleased to inform me that many people find Liadens irritating.”

“So they do,” his delm agreed gravely. “Most especially do yos’Pheliums who have not yet attained their thirtieth name-day find Liadens annoying. If you will accept the experience of one who is your elder, I will certify that the annoyance does ease, with time.”

Daav bowed acceptance of an elder’s wisdom. “I would welcome instruction on how not to do a murder in the interim.”

Korval tipped her head, looking into his eyes with such intensity he thought she must see into his secret soul. It required effort, to neither flinch nor look away, but less effort—noticeably less effort—than had been required, even five years ago.

“As concerned as that,” Korval murmured and looked down at her folded hands, releasing him. She was silent for a few moments, then looked back to his face.

“Very well. The Delm will take her Decision under review.”

Daav felt his knees give, and covered the slight sag with a bow of gratitude.

“All very fine,” said Korval. “But I will not start you in the habit of questioning Delm’s Decision.”

“Of course not.” He bowed again, every line eloquent of respect.

“So very well-trained,” Korval murmured, rising from her chair. “It’s nothing short of marvelous.”

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Frowning, Daav considered the gun.

It was not a pretty gun, in the way meant by those who admired jeweled grips and platinum-chased cylinders. It was a functional gun, made to his own specifications and tuned by Master Marksman Tey Dor himself. It was also small, and could be hidden with equal ease in Daav's sleeve or his palm.

Etgora's evening-gather, now. It might please his mother to dismiss this evening's affair as tedious, but the papers forwarded by dea'Gauss had shown that it was not so long ago that Clan Etgora and Clan Korval had come at odds—and when Balance was done, it was Korval who showed the profit.

Etgora had pretensions. A clan with its profit solidly in the star-trade, they had strained after High House status, and fell but a hand's breadth short before the loss to Korval set them a dozen years further back from the goal. There was bitterness in the House on that count, Daav did not doubt.

However, if Etgora wished to secure its teetering position as a high-tier Mid House, they must show a smooth face to adversity. Of course they would place Korval upon the most-honored guest list. They could not do otherwise and survive.

By the same logic of survival, Etgora would take utmost care that no slight or insult befell Korval while she was in their care.

Which meant that Daav, chancy tempered as he knew himself to be, might safely leave his hideaway in its custom-fitted box.

And yet . . .

"Might," he murmured, slipping the little gun into his sleeve, "is not ought."

He glanced to mirror, smoothed the sleeve, twitched the lace at his throat, touched the sapphire in his right ear and made an ironic bow. His reflection—black-browed, lean and over-long—returned the salutation gracefully.

"Do *try* not to kill anyone tonight, Daav," he told himself. "Murder would only make the evening more tedious."

They were admitted to Etgora's townhouse and relieved of their cloaks by a supernaturally efficient servant, who then bowed them into the care of a child of the House.

She had perhaps twelve Standards, hovering between child and halfling, and holding herself just a bit stiffly in her fine doorkeeper's silks.

"Kesa del'Fordan Clan Etgora," she said, bowing prettily in the mode of Child of the House to Honored Guests. She straightened, brown eyes solemn with duty, and waited for them to respond, according to Code and custom.

"Chi yos'Phelium," his mother murmured, bowing as Guest to House Child, "Korval."

The brown eyes widened slightly, but give her grace, Daav thought; she did not make the error of looking down to see Korval's ring of rank for herself. Instead, she inclined her head, with composure commendable in one of twice her years, and looked to Daav.

He likewise bowed, Guest to House Child, and straightened without flourish.

"Daav yos'Phelium Clan Korval."

Kesa inclined her head once more and completed the form: "Ma'am and sir, be welcome in our house." She paused, perhaps a heartbeat too long, then bowed. "If you would care to walk with me, I will bring you to my father."

"Of your kindness," his mother murmured and followed the child out of the welcoming parlor, Daav walking at the rear, as befitted one of lesser rank who was likewise his delm's sole protection in a House not their own.

Kesa led them down a short, left-tending hallway, through an open gateway of carved sweetstone and out into an enclosed garden, and the full force of the evening gather.

Etgora, Daav observed, as he followed his mother and their guide down cunning, crowded walkways, was a Clan which addressed its projects with energy. Challenged to display a clean face to the world, it did not hesitate to bring the world together immediately for the purpose.

A more conservative Clan, Daav thought, his quick, Scout-trained eyes catching glimpses of an astonishing number of High Houselings among the crowd, would have invited Korval, of course, to this first gather since its failure, and perhaps one or two others of the High Houses, at most. Not so Etgora, who seemed to have formed the guest list almost entirely from the Fifty, with a few taken from the ranks of the higher Mid-Level Houses, for the purpose, Daav supposed, of filling out odd numbers.

Progress along the pathways was slow, what with so many acquaintances who must be acknowledged with a bow. Both Daav and his mother several times had to duck under gay strings of rainbow-colored streamers and the imported oddity of Terran-made balloons.

At long last, they achieved the center of the garden, where a man slightly younger and a good deal less elegant than his mother was speaking with apparent ease to no other than Lady yo'Lanna. Daav owned himself impressed. Lady yo'Lanna was his mother's oldest friend among her peers in the High Houses, and he held her in quite as much awe now as he had at six.

"Father," Kesa bent deeply, the full bow of clanmember to delm, and straightened self-consciously, shoulders stiff beneath her finery.

"Your pardon, good ma'am," the gentleman murmured, and, receiving Lady yo'Lanna's half-bow of permission, turned to face them.

"Kesa, my child. Who have you brought me?"

"Father, here is Chi yos'Phelium, Korval, and Daav yos'Phelium Clan Korval," the child said in the very proper mode of Introduction. She turned and bowed, House-Child to Guests. "Honoreds, here is my father, Hin Ber del'Fordan, Etgora."

So Kesa's father was Etgora Himself. It explained much, Daav thought, from the unexpected youth of the door guardian to her stiff determination to observe every mode precisely.

"Korval, you do me honor!" Etgora swept the bow between equals—theoretically true, between delms, Daav thought wryly—and augmented it with the trader's hand-sign for "master", a nice touch, drawing on the common trading background of both Houses while publically acknowledging Korval's superiority.

His mother, Daav saw, was inclined to be amused by their host's little audacity. She bowed just short of full Equal, accepting the master status Etgora acknowledged.

"To be welcome in the house of an ally is joy," she said clearly into the sudden nearby silence. She straightened and extended a hand to touch Daav's sleeve.

"One's son, Etgora."

"Lord yos'Phelium." The bow this time was Delm to Child of an Ally's House: High Mode, indeed, but carried well, and necessitating, alas, the rather tricky Child of a Delm to an Ally as the most precise response. He straightened in time to see his mother incline her head to Lady yo'Lanna.

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"Ilthiria, I find you well?"

"As well as one can be in this crush. Etgora is proud of his achievement—and justly so!—but you and I know how to value an empty garden."

Had he been less well-trained, Daav would have winced in sympathy for Kesa's father. Lady yo'Lanna, it seemed, was not *entirely* at one with her host.

The pale eyes moved, pinning him. "Young Daav, newly at leave from the Scouts."

He bowed, lightly. "I have no secrets from you, ma'am."

"Do you not?" Her eyebrows rose. "Then come to me tomorrow and whisper in my ear the tale of how a certain mutual acquaintance came to break his arm in mid-Port evening before last."

Damn. He bowed again, aware of his mother's gaze on the side of his suddenly warm face.

"If that is your wish, then how can I deny you?"

"Very properly said," Etgora interjected. "And who better to know Port gossip than a Scout, who are said to have ears in every cranny?" He turned, spied his daughter, yet standing stiffly to one side.

"Kesa, my jewel. Lord yos'Phelium will wish to reacquaint himself with his age-mates, as he is just returned from the Scouts. Pray show him to the Sunset Garden—and then you may refresh yourself." He turned to Daav.

"Card tables have been set out, sir, and other light amusements. Please, be easy in our House."

He flicked a glance at his mother, who inclined her head. "Amuse yourself, Daav, do. Etgora will wish to walk Ilthiria and myself through his garden. I will require your arm in two hours."

"Ma'am." He bowed obedience to the delm, then a general leavetaking to Lady yo'Lanna and Etgora. This done, he bowed once more, very gently, and offered his arm to Kesa del'Fordan.

"Lady Kesa, will you walk with me?"

She hesitated fractionally, brown eyes lifting to his face in a child's straight look of assessment. Whatever she saw convinced her that he was not having fun at her expense, for she stepped forward and put her hand lightly on his sleeve.

"Certainly, I will walk with you," she said, unselfconsciously. "How else may I show you to the Sunset Garden?"

"Very true," Daav replied gravely. From the edge of his eye, he saw Etgora offer an arm and his mother take it. "In which direction shall we walk, then, Lady?"

"This," she said, moving a hand to the west, belatedly adding, "Of your goodness."

The pathways toward sunset were somewhat less crowded than those they had followed from the house. That was not to say, Daav thought, that the paths were empty or that the garden reposed in tranquility.

He bowed briefly to Lady pel'Nyan and moved on, Kesa del'Fordan silent on his arm. Etgora, he considered, had come a fair way to making a recover. Lady yo'Lanna's attendance had of course assured the attendance of several other Houses of rank. And if *she* were inclined to smile up on Etgora . . .

Or, Daav thought suddenly, if Ilthiria yo'Lanna attended at the request of her old friend Chi yos'Phelium, delm of the ancient ally of her House? Oh, yes, that fit well. Especially when one heard one's mother declaring herself comforted in the presence of an ally. Korval had never taken allies easily, to the benefit, mostwise, of the more conservative Clans.

Daav made a mental note to review the Summary of Balance dea'Gauss had sent more closely. He had missed the reason that



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Etgora was thought necessary to the interests of Korval. Presumption had, of course, been answered, but it seemed that the upstart Clan could not be allowed entirely to sink. Thus, this gather, with its theme of courteous and charming commonsense, and everyone of consequence in attendance.

In consideration of which, Daav said to himself, you are in arrears of your duty.

He tipped his head, assessing his companion from beneath his lashes. She looked pale, he thought, and her jaw was definitely clenched too tightly for fashion. Her shoulders moved like boards beneath the pretty silk tunic and the hand that rested against his sleeve put no pressure on his arm at all.

He cleared his throat gently and smiled when she looked up, startled.

"I hope you will allow me to commend your performance as House Guard," he murmured. "I am persuaded that you stand the duty often."

Kesa blushed, lashes flickering. "Not," she said, somewhat faintly, "so very often." She paused, glancing aside, then looked back to his face.

"In fact," she said, rather breathlessly, "this evening is the first time I have stood between the House and the world. It is—it has been my brother's duty, you know—he is the elder—but, this evening, he . . . He asked our father for other work."

"Very proper in him," Daav murmured, noting her hesitation and drawing the conclusion that Kesa's brother's "ask" had very little of "if-you-please" about it. "So this was your first time a House Guard? I am all admiration. Well I remember my first time at the door—a mere dinner party, nothing like what we have here!—and I was wishing for nothing but my bed before even half the guests were arrived!"

She actually laughed, and Daav ducked as they passed beneath a string of balloons and streamers.

Kesa paused, frowning up at him and the balloons just behind his head.

"I do not—you are very tall, are you not? I recall my father said that Korval is a tall Clan. He—Jen Dal was to have made certain the lines were strung well above—but I am certain," she said in a sudden rush, "that he could not have realized that, that—"

"That the pickpocket who wishes to rob Korval must bring his own stepladder," Daav said lightly, rescuing her from what could only be an unfortunate culmination of her sentence.

Kesa frowned. "I do not entirely—"

"Ah, Daav! I had heard the Scouts had released you to us!" The voice was lovely, as was the lady. Two years ago, he had been besotted with both. He was no longer besotted, but he was indebted to her for a lesson well-delivered and equally well-learned, and so he bowed, with courtesy.

"Bobrin, good evening to you."

She returned his bow, eyes teasing his face, then straightened, one hand rising to her flower-braided hair. Her eyes left his face, and found Kesa.

"It is Etgora's daughter, is it not?"

Kesa bowed low—Child of the House to Honored Guest. "Kesa del'Fordan, Lady del'Pemridj."

"Just so." Bobrin inclined her beflowered head, then shot Daav a glance of pure mischief. "Take advice and walk carefully with this one, House-daughter. Daav—" She paused, likely on the edge of more specific mischief. Daav met her eye squarely, and had the satisfaction of seeing her look aside.

"Daav," she said. "Good evening."

She swept down the path and Daav became aware that he was gritting his teeth. Deliberately, he relaxed his jaw and looked down at his companion.

Kesa was staring after Bobrin, brown eyes wide. After a moment, she sighed and glanced up at Daav.

"She is a very beautiful lady. I—do you think when I am grown I might wear flowers in my hair?"

When you are grown, Daav thought, my hope is that you will care more for other matters—even for what I deduce is your scapegrace brother—than for the dressing of your hair.

Her look, however, was appealing—and she was, after all, a child—so he swallowed his initial answer and instead looked about with wide amaze, flinging his arm out.

"Why, here we are in the very heart of a garden! What is to prevent you from having flowers in your hair this instant, if you wish it?"

"I—" She, too, stared about, as if she just now realized their setting, then looked back to his face.

"No one, that is, I have yet to learn the—the proper manner in which to place flowers in the hair."

"Ah, there you are fortunate," Daav said gaily. "I have some training in the placement of hair-ornaments. Perhaps you will allow me to be of service to you."

The brown eyes took fire. "Would you? I—I would be in your debt."

"Not a bit of it," Daav said stoutly. "It is a pleasure to share my skill. Now, which flowers will you have?"

She moved to the edge of the walk, staring at the orderly rows of blossom. "That, if you please," she said, pointing to a low, spike-leaved shrub. Its indigo blooms were flat and multi-petalled, noteworthy without being ostentatious, and a good match for the silk Doorkeeper's tunic.

"Excellent," Daav murmured approvingly and bent to pluck one. The stem was woody, but broke easily. "Yes, very good. Now, my Lady, if you will step over here, so that we do not impede traffic while this very delicate operation is performed . . ."

Kesa stepped to his side, Daav inclined his head to Lord Andresi—another of his mother's cronies—who smiled and passed on without comment.

"Now, then," Daav said. "I will wish you to stand very tall, but not at all stiffly. True beauty is never ill at ease. Very good. A moment, now, while I discover the perfect placement—yes, I believe so." He hesitated, flower poised. "Be easy, Lady Kesa, but as still as you may—" He moved, Scout-quick, smoothing her thick brown hair with one hand while he slid the flower home just above her right ear.

"Let us be certain that it is well-anchored," Daav said, hands hovering. "Move your head now—look up at me. Ah—"

"Stand away from my sister!" The voice was, of course, too loud. Had the phrase been whispered it would have been too loud, at this gather. Daav sighed and glanced up.

The young man bearing down on them had something of Etgora's look to him, albeit Etgora in an ugly pet. He had, Daav judged, about twenty Standard years.

"Calm yourself, sir," Daav said moderately. "I am doing your sister no harm."

"I will be the judge of that, sir!" the other snapped. "As kinsman, I—"

"Jen Dal, be still!" Kesa flung about—the flower stayed firmly in place, Daav saw with pleasure. "There's nothing amiss." She swallowed and glanced back to Daav. "Lord yos'Phelium, here is

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my brother Jen Dal del'Fordan. Jen Dal, here is Daav yos'Phelium Clan—"

"I know who he is," Jen Dal said awfully. "Sir, you have not yet put yourself at a decent distance from my sister." Kesa made a sound rather like a splutter, which Daav interpreted as outrage. Her brother spared her a single withering glance.

"Be still, Kesa. This is a matter of honor."

"If it's a matter of *my* honor," Kesa said, with spirit, "then I should judge the damage and the price, not you."

"Completely by Code," Daav said, uneasily aware that they were attracting a crowd.

The young gentleman stared at him, eyes hard with hatred. *So, thought Daav, the balloons were not strung so low by accident. Here's one who has taken Etgora's fall as a blow to his heart, and cannot see 'round his anger to the greater good of the House.*

"My sister is a child, sir. It is as ludicrous to expect her to know proper Code as it is to expect her to know all the faces of harm."

Daav drew a breath, trying to still the quick flare of anger. For Kesa's sake, for the sake of Etgora's value to Korval, he would *not* lose his temper. He would quell this self-important upstart and dismiss him, then disperse the growing crowd of the curious. He was Chi yos'Phelium's son. These things were not beyond him.

"Sir, your concern for your kin does you credit. However, I feel that you have allowed an elder sibling's natural partiality —"

Jen Dal del'Fordan turned his face away. "Kesa," he said, as if Daav had finished speaking—no, as if Daav had never *begun* to speak!—"pray remove yourself from the proximity of this—person."

Tears filled the brown eyes. "Jen Dal, he is our *guest!* I am quite unharmed, Lord yos'Phelium was only placing a flower in my hair, as I asked him to do!" There was a ripple through those gathered at that, but Jen Dal was unmoved.

"This man is son of a House with a long history of predation among the lesser Houses. I will not see him attack my kin. He will—"

Oh, gods, Daav thought, suddenly seeing the destination of the farce. *You fool!* He leaned forward and touched Kesa lightly on the sleeve.

"Lady, your brother is correct. You cannot stay this."

For a heartbeat, the brown eyes searched his face, then she stepped back, bowed fully—House Child to Honored Guest—and turned. She walked away as sedately as one with years of negotiation behind her, and the crowd parted to let her through.

"You, sir," Jen Dal del'Fordan cried, "will satisfy the honor of my House!"

"Don't be absurd," Daav said, voice stringently calm, despite the anger trembling within. "The honor of your House is intact, as you well know."

"I know nothing of the sort. Korval destroys Clans as casually as I pluck a flower," the last was said with a sneer and Daav caught his breath at the sheer, blinding stupidity of the man. Did he not know that even now Korval and Etgora were mending the damage given his Clan? Did he not know that with Korval's patronage and the smiles of the High Houses, Etgora would recover its loss and reap new profits before Kesa signed her first Contract lines?

"You do your sister an injustice—you call her honor and her understanding into question before all these." He threw an arm out, showing the so-quiet crowd damming the pathway. "Is this the path a brother treads, in the task of keeping his kin safely? Your

understanding is at fault in this, sir. Neither Etgora nor Etgora's children has taken lasting harm from Korval. Have done and stand away."

Jen Dal del'Fordan smiled. "And I say," he returned, voice, without doubt, pitched to carry far into the gardens, "that Korval has tainted Etgora's honor. Everyone here has heard me. I will have satisfaction, sir!"

Fool! Daav raged, forcing himself to breathe deeply. He bowed, deliberately, in the mode of Master to Novice, taking a savage satisfaction in the gasp from the crowd.

"Call the House's dueling master," he said, and his voice was not—quite—steady. "I will satisfy you."

From the corner of his eye, he saw the crowd waver and reform with Etgora and his mother in the first rank. His mother's face was very calm.

The card tables in the Sunset Glade had been hastily removed to make room for the combatants. Clan Etgora's dueling master bowed to Daav.

"My Lord yos'Phelium. As the one challenged, you may choose the weapons of the duel. The House can provide pistols, swords, knives, or Turing forks from its own arsenal. If you wish a weapon we do not own, the House will acquire a matched set of the weapon of your choice, within reason. If it appears, in the judgement of the Master of the Duel, that your weapon has been chosen with an eye to indefinitely postponing this duel, you will be required to choose another weapon. Is this understood, sir?"

"It is." Daav closed his eyes, briefly considering edges and explosives, bludgeons, the perfectly tuned gun in his sleeve, but—no. Such weapons were insufficiently potent; they limited one to the infliction of mere physical damage. He required—he *would* have—a fuller Balance.

Daav opened his eyes and pointed at the gaily colored balloons, strung on their strings at the edge of the glade.

"There is my weapon of choice, sir. If the House is able, let a dozen of those be filled with water and let both my opponent and I choose three. Can this be done?"

The dueling master bowed. "Indeed it can. And the distance?"

"Twelve paces, I believe," Daav said, counting the moves. "Yes, that will do."

"Very well," said the dueling master and went away to give instructions.

The balloons arrived in very short order and were placed, carefully, on the lawn. A murmur rose up from the crowd—and an outcry from Daav's opponent.

"What is this? Toys? Do you consider a challenge from Etgora a matter for mockery, sir? Dueling master! Take these insults away, sir, and bring us the matched set in the mahogany case!"

The dueling master bowed. "The rules of the duel state clearly that weapons are the choice of the challenged, sir. Lord yos'Phelium has chosen balloons filled with water, at twelve paces. He is within both his rights and the bounds of the duel."

"I will not—" began Jen Dal, but it was Etgora who spoke up from the sidelines.

"Do you know, my son, I think you will? Lord yos'Phelium has made his choice. Plainly, he is a man who stands by his decisions, no



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matter how foolish they may appear. I would counsel you to do the same."

"Lord yos'Phelium," said the Master of Duel, "choose your weapons."

Daav stepped forward, knelt in the grass and picked up the first balloon. It was not quite as firm as he wished and he set it aside. The second pleased him and he cradled that one in his arm. The third...

"Will you hurt him?" Kesa asked from his side. He glanced at her, unsmiling.

"I do not think these will hurt him, though that is always a danger, in a duel."

"But you will make him ridiculous," said Kesa. "Jen Dal hates to be laughed at."

"Many people do," Daav said, finding his third weapon in the seventh balloon. He tucked it neatly in the cradle of his left arm and rose to his feet. "Stand clear of the firing range, Lady Kesa. Of your kindness."

She hesitated a moment longer, throwing one of her disconcertingly direct looks at his face. Then she bowed, simply, as between equals, and walked sedately to her father's side, in the first rank of spectators.

Daav waited while his opponent randomly picked his weapons, then stomped to the center of the field, the balloons wriggling and threatening to leap from his ineptly crossed arms.

The dueling master held his hands over his head.

"The contestants will count off six paces each, turn and stand steady. First shot to the challenged. A hit is counted only on a strike to the body of one's opponent. The affair is finished when each contestant has expended his ammunition. The win goes to the contestant who has taken the least hits, or to he who draws first blood. In case of tie, Lady yo'Lanna shall decide the victor." He lowered his hands and stepped back.

"Gentlemen, turn. Count off. One! Two! Three! Four! Five! Six! Turn! Lord yos'Phelium, fire at will!"

Defly, Daav plucked a balloon from the cradle of his arm, gauged its flow, probable spin and mass—and threw.

The balloon elongated, caught up with itself, tumbled once and hit Jen Dal's tunic, dead center, with a satisfying *splat*. Someone in the crowd laughed, and quickly stopped.

"This is a farce!" shouted Jen Dal.

"It is a duel," the master returned sternly. "Attend, if you please, sir. The shot is yours."

Jen Dal clumsily tipped his balloons onto his off-hand, snatched one free, holding it firmly—as it happened, a bit too firmly, for the sphere exploded, showering him with water.

Ignoring the resulting curses, the dueling master looked to Daav, who sent his next balloon high into Jen Dal's left shoulder.

The dueling master had scarcely given his sign before the sodden young man had snatched up his second balloon—somewhat less robustly—and hurled it in Daav's direction.

It was a good throw, only missing by twelve or fifteen inches. Daav weighed his last balloon in his hand and considered deloping.

"A duel with toys and water," Jen Dal del' Fordan called from his position. "Korval takes good care that *it* spills no blood for honor."

The balloon was airborne before Daav had taken conscious thought. It sped, hard and true, and struck his opponent precisely in the nose.

Jen Dal howled, dropped his remaining balloon and bent double, both hands rising to his face. Med-techs rushed in from the sidelines and the dueling master raised his hands above his head.

"Lord yos'Phelium has drawn first blood! The duel is done!"

66 However did you hit upon water balloons?" his mother inquired some time later, in the privacy of Jelaza Kazone's upstairs parlor.

"Something I read of Terran custom," Daav said hazily. "You know what Scouts are, ma'am!"

"Indeed I do," she replied, sipping wine and looking out into the peaceful night-time garden.

Abruptly, she turned from the window. "Daav, I am persuaded you did right to speak to the delm about your worthiness to stand Korval."

He froze, heart rising into his throat. She had seen! Observing the duel with Korval's Own Eyes, she had seen his error. She understood that at the moment of decision he had not acted for the good of the Clan but from his own sense of injury, exacting a Balance—a *personal* Balance—brutal of a halfling's dignity.

Worse, he had gained an enemy of his own rank—for he had heard, later, that Jen Dal was Etgora's heir—who hated him now, and would surely hate him when they both came delm-high. All his mother's careful work, undone. Undone, because Daav could not put the good of all before his own bad temper.

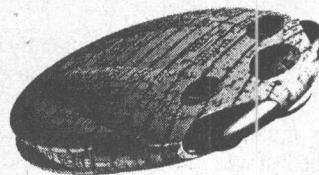
It must be Er Thom, now, he thought. *With Er Thom as Korval, Etgora may deal without malice, saving only I'm kept sanely out of sight...*

Belatedly, he became aware of his mother's eyes upon him, and bowed. "Ma'am..."

She raised her hand. "Speak not. I will tell you that the delm has reviewed her Decision, based on what she has seen of your understanding and judgement this evening. You acted as well as inexperience might, preserving both Etgora's heir and the peace between our Houses. With age will come . . . tidier . . . solutions." She smiled faintly. "You are na'delm, my son. Korval-to-be. I trust you will not feel it necessary to revisit the matter. I doubt you will find the delm so accommodating again."

He stared, speechless. She had seen with Delm's Eyes, but she had *not* understood. Korval Herself had erred in a matter of Clan. He moved his head, trying to clear his vision, which was abruptly indistinct.

His mother moved forward, smile deepening. "Don't look so stricken, child," she said gently. "You'll do very well." She raised a hand to cup his cheek. "Or at least as well as any of us have."



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Leap of Faith By Allen Steele

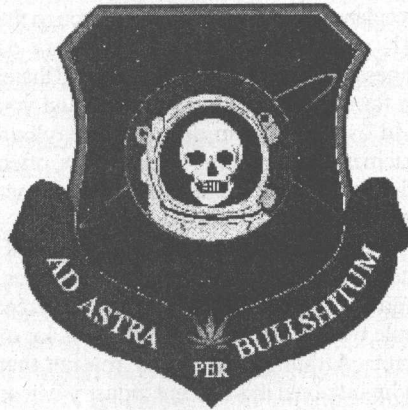
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Although movies aren't the topic of this issue's column, let's start by talking about the seminal science fiction film of the 1950s: *Destination Moon*.

Filed in 1949 from a screenplay cowritten by Robert A. Heinlein, Rip Van Ronkel, and James O'Hanlon, directed by Irving Pichel and produced by George Pal (to whom Messrs Spielberg, Lucas, Cameron, and Emmering owe a vast debt), *Destination Moon* was the *Star Wars* of its time, inspiring the creation of a dozen major, and at least two dozen minor, science fiction movies during the fifties. The reason classics such as *When Worlds Collide*, *The War of the Worlds*, *The Day the Earth Stood Still*, and *Forbidden Planet* were made later was because *Destination Moon* did boffo business when it was released in 1950.

Yet, even more important than that, *Destination Moon* was the first film since Fritz Lang's *Die Frau in Mond* (*Woman in the Moon*, 1927) to treat its subject matter seriously. All the key people involved in the project—Heinlein, Pal, and Pichel, along with technical advisor Willy Ley and artist Chesley Bonestell—were dedicated to producing a realistic portrayal of spaceflight, at least as could be foreseen at the time. It was a tough job, and not only because of budget restraints and time-consuming special effects; according to Heinlein's article in the April 1950 issue of *Astounding*, "Shooting *Destination Moon*," bewildered studio chiefs came close to demanding that the film be reshot as a Gene Autrey-style musical western, complete with singing cowboys in spacesuits and a dude ranch on the Moon. Yet Pal, Heinlein, and company managed to fight past all this, and the final result was a masterpiece which holds up to this day.

About twenty minutes into the movie, there's a scene in which the protagonist, an aircraft industrialist named Jim Barnes (played by John Archer) has invited a group of entrepreneurs and corporate heads to a meeting. These tycoons are decked out in formal evening wear—save the stereotypical Texan who showed up wearing a bolo tie—and they're sipping cognac and smoking cigarettes. Barnes has just rolled down a movie screen to show them a cartoon in



which Woody Woodpecker—it's 1950, remember? Lisa Simpson hasn't been born yet—explains the basics of rocket travel. Now the cartoon is over, and Barnes has launched into his sales pitch: he intends to build a single-stage rocket that will go to the Moon, and he wants them to pay for it.

The businessmen are respectful, yet skeptical: why the hell should they bankroll something as preposterous as a moon rocket? Barnes lays it on the line; if the United States won't, then someone else surely will (i.e. the Russians, although they're not indicted by name). He calls on his cohort, General Bowles (Warner Anderson) to explain the situation, and the old man restates Barnes' position: since the U.S. Government isn't leading the way, then it has fallen on private industry to send men to the Moon, because if we don't do it, then those dad-blame Russkies will get there first and drop nukes on everyone. That settles the issue. With remarkably little debate, the fat cats give Barnes carte blanche to build his atomic rocket. A few minutes later, after a montage of industrial scenes—iron pouring into lathes, rivets being pounded, etc.—we see the moon ship under construction in the New Mexico desert, just in time for the rube from Brooklyn to say, "Dis ding'll never git offa ground!"

That isn't how history occurred, of course. Yes, the Apollo missions went to the moon less than 20 years after *Destination Moon* was made, and yes, private industry built the Saturn V, and yes, the objective was

to beat the Russians. Yet all this was done under the auspices of a large government agency, with American taxpayers paying the bill; when the public got tired of space (or were politically persuaded that they were—but that's another kettle of fish) Congress and the White House stopped signing the checks, and... well, you know the rest.

Fifty years has passed since *Destination Moon* was made, yet all of sudden, without anyone really noticing, the scenario it presented is beginning to look plausible.

Of the major space advocacy groups—the National Space Society, the Planetary Society, the Space Studies Institute, and so forth—one of the more recently established is the Space Frontier Foundation. Formed in 1988, it isn't quite as high-profile as the NSS or the Planetary Society, yet it's just as active, albeit in a low-key sort of way. Unlike most other space organizations, the Space Frontier Foundation isn't much interested in raising grassroots support for NASA; instead, its primary focus is upon advocating commercial space industrialization, the theory being that private enterprise can accomplish more than the federal government, and a hell of a lot faster to boot.

This is something of a radical proposition, for most people have become accustomed to the notion that NASA is the only organization that can successfully explore space. Surprisingly, there's a number of SF writers adhere to the same belief; one author I know has gone so far as to state that the two greatest failures of the 20th century are Communism and the space program. Yet the very term "space program" is a holdover from the Apollo era, since it implies that there's been only one, single-purpose space effort, and one whose objectives were met nearly 30 years ago. But NASA's own Chief Administrator, Daniel S. Goldin, has been an outspoken proponent of private-sector space exploration; during his tenure, for instance, shuttle maintenance and pre-launch operations at Cape Canaveral have been privatized under United Space Alliance, an industrial consortium led by Lockheed-Martin.

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This is where the Space Frontier Foundation comes in. The Foundation, as it refers to itself—and, yes, the allusion to Isaac Asimov's Foundation stories is deliberate—considers the shuttle to be an adequate test vehicle, but certainly not a means unto itself; a new generation of piloted and unpiloted launch vehicles needs to be built which would make Earth orbit far more accessible to free enterprise. The Foundation believes that the International Space Station should be built (although it has long argued that it could have been done faster and less expensively by other means), but it also believes that, once the ISS is complete, it should be sold to private industry. The Moon needs to be explored, not just for the sake of basic scientific knowledge, but also for its potential resources; asteroids, specifically those whose orbits bring them close to Earth, are another near-term objective, for much the same reason. Sending an expedition to Mars is cool, but that's something NASA should undertake along with the international science community. No flags, no footprints—that's the Foundation's unwritten motto.

For the sake of full disclosure, I should mention here that I'm a member of its Board of Advisors. Some of the other members include former NASA astronaut Pete Conrad, scientists Freeman Dyson and George Friedman, rocket engineers Robert Zubrin and Max Hunter, *Star Trek: Deep Space Nine* producer Rene Echevarria, and authors Frank White and Eric Kotani. It was in this capacity that I attended its seventh annual Space Frontier Conference in Los Angeles last October.

The conference was held at the Sheraton near L.A. International, and it pretty much resembled, at least superficially, any of the dozen or so business conventions I covered during my former career as a journalist. No propeller-beenies, no jeans, no *Babylon 5* T-shirts; Brooks Brothers suits, white button-down shirts, and red-striped ties were the preferred mode of dress. The men and women gathered in the hall outside the meeting rooms looked like who they were: CEOs and executive vice-presidents, bankers and marketing specialists, industrial engineers and scientists, with a few journalists scattered in here and there. It was hard to tell them apart from a convention of lawyers being held in the next hall.

Very strait-laced, very conservative. Yet the sessions on the program agenda were those which any hard-SF fan would have immediately recognized: "Asteroid Resources," "Space Resources for Space

Solar Power: Energy for the Third Millennium," "Space Station for Rent?" "Space Adventure Tourism; I Want to Go!" "Mars on \$50 a Day?" "Return to the Moon," and so forth. On display in the exhibitors room were a commercial sounding rocket, a CGI videotape of a proposed single-stage-to-orbit manned spacecraft, and a scale-model of the Lockheed-Martin X-33 spaceplane. Taking a casual stroll through the hall, you passed small clusters of businessfolk huddled together here and there; stop for a moment to tie your ties, and you could overhear them discussing payload capacities, IPS, thrust, and mass ratios, often in the same breath as anticipated customer demands and government deregulation.

This is exactly the sort of thing SF writers have been writing about for decades, yet now it's coming from a different source: people who intend to make money. A lot of money. Although they fully realize that they're involved in a nascent industry whose risks are neither small nor negligible, virtually everyone approaches this as a business opportunity. The 21st century is rapidly approaching, and although you can still make a safe buck by investing in fast-food franchises, those with a sense of adventure are looking elsewhere. Take this train of thought far enough, and suddenly you find yourself inside a science fiction novel: not reading it, but actually experiencing it.

This type of thing has happened before. Twenty years ago, the frontier was cybernetics. When computers were still enormous, exotic machines which required dust-free, air-conditioned environments and were programmed through punch cards and magnetic tape, a handful of entrepreneurial geeks saw the potential for change. Some were inspired by science fiction, others by market opportunity, but whatever the reason, they created the most profound industrial revolution since the mid-1800s, and they accomplished it within a single generation. Now it's the end of the 20th century, and although one of those geeks has become Bill Gates, there's nothing new nor magical about computers, only variations upon someone else's source code. Unless you've got a product that can compete with Microsoft on its own turf, there's nowhere left to go...

Except up.

The buzzword of Space Frontier 7 was CATS. Not the Broadway play, but the acronym for Cheap Access to Space: an inexpensive, reliable means of sending payloads into Earth orbit which does not rely

upon either the NASA space shuttle or expendable launch vehicles (ELVs) like the Delta or Ariane. This is the Holy Grail of the commercial space industry, and it has led to a new space race—not between nations this time, but between companies.

The goal is to build a single-stage-to-orbit (SSTO) spacecraft which can be maintained and operated with much the same efficiency as a present-day airliner. The NASA space shuttle requires a ground crew of about 30,000 people, and it has a turnaround-time of about one month between missions—even longer, if vital hardware has to be replaced, and very often the shuttles have to borrow parts from one another. All this leads to a payload cost of approximately \$10,000 per pound. I weigh about 190 pounds getting out of the shower, so if I had managed to get my shuttle ride 14 years ago when I was an applicant for NASA's short-lived Journalist In Space Project, it would have cost nearly \$2 million to send me into space—probably a little more, when one factors in flight suit and helmet. What everyone wants is an SSTO which would require a ground crew of only a few dozen people and would have a turnaround-time of about one week, and would have a payload cost of \$1,000 per pound, or less.

The launch industry foresees three major markets for SSTOs. Obviously, the first is the commercial satellite industry. The new Iridium system is only the harbinger of a new generation of communications satellites which will soon make cell phones as obsolete as the Marconi telegraph. Something has to lift these birds into orbit, but no one really trusts the present ELVs; they may be cheap, but you can use them only once, and they have a unfortunate tendency to blow up shortly after launch. The second market is NASA itself. Once the ISS is fully operational four or five years from now, the shuttle fleet will be reaching the end of its anticipated lifespan. Lockheed-Martin's X-33 program is the one-third-scale prototype for VentureStar, which is intended to be the replacement for the shuttle; however, since VentureStar is presently designed to be an unmanned spacecraft, a new man-rated spacecraft will eventually be needed to ferry crews to the space station.

The third major customer is, believe it or not, space tourism. No less than three sessions during the conference addressed this issue. A number of market studies have already been undertaken to gauge public interest in adventure vacations in low-Earth orbit, and it came as a considerable surprise that nearly 85% of survey respondents

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between the ages of 20 and 50 are interested in traveling into space, even if it's only short-duration flights of a few hours. The trick, of course, is to make such jaunts reasonably affordable—say, \$50,000 to \$100,000. Perhaps this will make space tourism the privilege of the rich, but consider it this way: if you're a well-heeled 21st-century yuppie and you've got a choice between a new Porsche or bragging rights to being an astronaut, which would you take? Personally, I'd take out a second mortgage and drive my Subaru for a few more years.

All this depends on achieving cheap access to space. Without CATS, that dog won't hunt. Yet already there are six different companies actively competing to build the first fully-operational SSTO. The most prominent of these, of course, is Lockheed-Martin; it has the head start, and it already has NASA locked down as the major tenant for its VentureStar. Pending successful completion of X-33 program, the VentureStar is scheduled to begin flight tests in 2004. With low-weight composite tanks and structure, automated control systems, and linear aerospike engines, it's being touted as being capable of lifting 50,000 pounds to low-earth orbit, 25,000 pounds to space-station orbit, and 13,000 pounds to geostationary orbit by means of a piggyback upper stage.

Lockheed-Martin is an aerospace giant, and its once-secret Skunk Works division is responsible for the creation of everything from the U-2 spy plane to the F-117 Stealth fighter. If Lockheed-Martin is Goliath, though, there are several Davids already loading their slings: small start-up companies already positioning themselves as potential rivals to VentureStar. During the Friday morning session, "New Space Launch Industry Roundtable," a standing-room only audience heard their proposals.

Chief among them is Rotary Rocket, a company founded by Gary Hudson, a rocket engineer who is something of a legend in the aerospace community. Its candidate is the Roton C-9, a spacecraft which closely resembles the DC-X test vehicle which McDonnell Douglas flew several times before the Department of Defense axed the Delta Clipper program and NASA selected VentureStar as its prize pony. The Roton looks a bit like the Delta Clipper—same upside-down ice-cream-cone shape, same four-point leading gear, same horizontal take-off-and-landing flight profile—except for two major differences.

First, the Roton will have a 2-person flight crew—a pilot and a cargo specialist, to

handle whatever is being freighted within the payload bay forward of the crew compartment. So, unlike the VentureStar, it's intended to be a man-rated space vehicle from the git-go. But the second difference is even more radical: the Roton is designed to land like a helicopter. Shortly before the Roton reenters Earth's atmosphere, four slender blades will unfold from its forward fuselage and extend to vertical position; after atmospheric entry, they will extend to horizontal position and begin to rotate. By this means, the Roton will descend to touchdown at its launch site, without using its main engines for soft landing.

This may sound like a goofy proposition—in all honesty, I was skeptical the first time I heard about—but the closer you look at it, the more it appears to make sense. In fact, it isn't a new proposal: rotor-assisted landings were first proposed during the early Apollo program, and NASA tested supersonic rotors in wind tunnels during that period. Like the VentureStar, the Roton's structure and fuselage is being made of lightweight composite materials, and it's using new engines for its primary propulsion system. It's designed to have a one-day flight profile—launch in the morning, landing in the afternoon—with a turnaround-time of a matter of days. Once the Roton goes into mass-production, Rotary Rocket hopes to make its purchase price below that of a Boeing 747. The first vehicle is presently under construction, and flight tests in the Mojave desert are slated for 2001. Several major players—including Barclays Capital, Arthur D. Little, and Wallace Smith—have already signed up as underwriters, and author Tom Clancy has already invested \$6 million of his own money in the project. If I had his royalty statements, I might be tempted to do the same.

Lockheed-Martin and Rotary Rocket may be the Prince and Madonna of the CATS space race, but there's always room for Elvis. In this case, it's Starcraft Boosters, whose CEO is no less than Buzz Aldrin, the pilot of Apollo 11. Buzz and his son Don, the company's president, have brainstormed the Starbooster 200, a spaceplane which will utilize Russian-make Zenit rocket engines. The Starbooster is a space truck, plain and simple: a winged suborbital spaceplane with a broad back upon which second-stage spacecraft would be ferried to high altitude. After a vertical launch and ascent to 120,000 feet, the Starbooster would launch its second-stage payload—20,000 pounds to space station orbit, or 10,000 pounds to geostationary orbit—before returning to its

launch site for a horizontal landing. Future developments could conceivably include using the spaceplane for tourism: taking a second Starbooster, removing the Zenit engine and installing a passenger compartment, then attaching the boosters belly-to-belly.

Other companies presented different proposals. Using a F-106 fighter hauled aloft by a C-130 transport, Kelly Aerospace has been testing the concept of towing a small spaceplane to high altitude, where it would then ignite its main engine and ascend to orbit. Universal SpaceLines, a small company headed by former Apollo astronaut Pete Conrad, is developing the basic technology for the low-cost manufacture of a spaceplane specifically designed for tourist jaunts. Pioneer Rocketplane intends to build a two-man spacecraft which would take off horizontally, ascend under its own power to high altitude by means of two Pratt & Whitney F-404 turbofan engines, where it would then be refueled by a tanker before using a P&W RD-120 rocket engine to climb to suborbit; after launching an upper-stage payload to LEO, it would then return to its launch site for a horizontal landing.

As to be expected, the DOD is also getting into the game, although its objectives are clearly different: protecting satellites. As Maj. Ken Verderame, Program Director for the Air Force's military space plane program, told the audience for the X-Vehicles panel: "When I look at space, what I see are targets ... and those targets have American flags on them." The USAF its own R&D program underway; it's already conducting drop-tests of its X-40A prototype spaceplane at Holloman Air Force Base, and plans to test the X-40B prototype in low orbit by 2002. Its objectives are different, but the goal is much the same: developing a SSTO which could be deployed from an airstrip anywhere in the world, using stripped-down ground operations much like that of any conventional aircraft.

At this point, the X-33/VentureStar is the leading contender. Although representatives of the smaller companies took turns making pot-shots at VentureStar—indeed, Mike Kelly of Kelly Aerospace went so far as to accuse Lockheed-Martin of using government subsidies to keep its R&D costs artificially low, thereby locking out competition from smaller companies—it was Buzz Aldrin who noted that none of these systems are necessarily designed to replace the shuttle, or even the VentureStar. Yet this apparently isn't stopping anyone from dreaming of a day when SSTOs—hopefully,

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their SSTO—will become the workhorse which sends NASA shuttles to the hangar for good.

Of course, all this should be taken with a grain or two of salt. Some of these projects will undoubtedly turn out to be vaporware, killed off by unfeasibility, inadequate technology, poor management, or simple lack of funds. The last may be the greatest obstacle, as was driven home during the panel on finance and insurance. Richard Smithies of Barclays Capital, one of England's largest investment firms and a major backer of both Iridium and Rotary Rocket, pointed out the launch industry is presently viewed by Wall Street as very risky, mainly because of the number of high-profile ELV failures in recent years but also because the average investor simply doesn't understand space. Shubber Ali, a senior consultant for KPMG Space & High Technology Practice, added that, since major investors don't believe in putting money into anything that doesn't promise a pay-off within three-to-five years, this puts more visionary ideas like orbital hotels and asteroid mining off the screen, or at least for the immediate future.

Even Walter Cunningham, the former Apollo 7 astronaut who's now a venture capitalist, is skeptical about all this. During his remarks, he threw some cold water on the crowd when he noted that most people within the space industry tend to be true believers—another buzzword, much like CATS, for better or worse—more than hard-nosed businessmen.

"A lot of this is based on faith," Cunningham said. "How many of you truly believe that VentureStar will get off the ground? How many of you really believe that it will be cheaper than an expendable launch vehicle?" There was a moment of self-embarrassed silence within the crowded meeting room when no one raised a hand.

Nevertheless, there seems to be a belief within the space industry that a revolution is about to begin . . . indeed, that it's already upon us.

Walt Cunningham is absolutely correct when he says that much of this is based on faith, but as any person with strong religious convictions will tell you, faith can be a very strong motivator. If it's anything else, science fiction is a literature of faith: if not in God, then at least in a future which is markedly different from our present circumstances. At many points during the conference, I saw the line between science fiction and reality being crossed, yet it wasn't until I heard Gene

Austin, the NASA program director for the X-33, quote Robert A. Heinlein from the podium—"If you can reach orbit, you're halfway to anywhere"—that I knew we had stepped across the line.

All the futuristic space-scenarios you've read about, all the dreams we've shared throughout the last century. As trivial as they've sometimes seemed, nonetheless they've inspired men and women to actually do these things, if only because of . . . well, for lack of a better word, faith.

Space colonization is not going to come easy, nor is it going to come cheap, yet it's an indication of just how seriously private industry takes this proposition that one of the items on Saturday's agenda was titled Commercial Space Pilots Workshop. While still wondering about this, I happened to run into a guy whom I had met only a month earlier in Baltimore, during the last World Science Fiction Convention. One of my readers, this fellow is a pilot for American Airlines, and he was at Space Frontier 7 specifically to attend this two-hour workshop. It appears that a couple of the start-up companies which intend to build SSTOs are already looking forward to the day when their ships will be towed out to the flight-line; this session was the preliminary step to recruiting professional pilots from the aviation industry. My friend Rob—in his early 40s, married and with a teenage son, as sane as sane can be—plans to become one of the world's first commercial spacecraft pilots.

Is this a leap of faith? Perhaps. Before you rush to judgement, though, consider this. During the 1920s, the great technological race of that time was to see who would be the first to fly non-stop across the Atlantic. Some believed that it simply couldn't be done—indeed, there were a number of proposals to place floating aerodromes halfway between Europe and America, where planes could land and refuel—and some believed that it could be done, but only through the construction of giant seaplanes such as the six-wing Caproni Ca 60 Transaero, which crashed during its maiden flight in Italy's Lake Maggiore. Yet the market was clearly there—not just for passengers, but also mail—and this is what prompted Charles Lindberg to build *The Spirit of St. Louis* and fly it to Paris. History remembers Lindberg for his heroism, and justly so, but we tend to forget that his reasons for making that harrowing solo flight in a hand-built aircraft were utterly practical. He wanted to make money, and from that flight, he created Eastern Airlines.

Seventy years later, you can fly from New York to London in six hours—less, if you take the Concorde—and doze off in your seat while watching a movie. Twenty or thirty years from now, do you think you'll do the same, as your spaceplane glides toward rendezvous with an orbital hotel? Maybe you will, but not me. I'll have my nose pressed against the window, remembering the day when all this was considered science fiction.

A foolish notion, maybe. I reckon we'll just have to call it a leap of faith.

Recommended Reading:

G. Harry Stine, *Halfway to Anywhere*. M. Evans and Company, 1997.

Robert A. Heinlein, "The Man Who Sold the Moon," novella reprinted in *The Man Who Sold the Moon*; Shasta Press, 1950; Baen Books, 1987.

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The Space Frontier Foundation: 16 First Avenue, Nyack, N.Y. 10960. Telephone (800) 78-SPACE. Web site: <http://www.space-frontier.org>

Lockheed-Martin VentureStar Web site: www.venturestar.com

Rotary Rocket Company: P.O. Box 1030, Redwood City, CA. 94064-1030. Web site: www.rotaryrocket.com



The 7th Key By Eric Morlin

Did I mention that my friend
Maelstrom was
cryogenically freezing rats and
trying
to revive them with
a heat lamp
and a car battery?
I was just wondering,
what is the sound of a thousand
shattering rose petals?

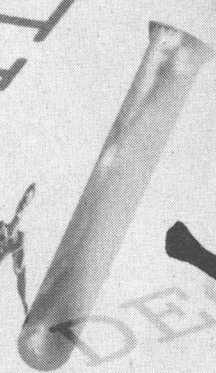
OE... MYOXYLIS VULGARIS D.E.H.

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PHEROMONELADEN

MYOXYLIS



Beryl's Run

by Bud Sparhawk

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WHAM! The impact of the shot slammed Beryl against the wall and spun her around. She reached up to her numb left shoulder, expecting to feel sticky wet blood, but her fingers only encountered the torn and ragged edges of her pack. The bullet must have ripped through the tough nylon strap and transmitted the shock to her shoulder, she realized. *I just hope that it didn't hit the package*, she thought. The whole reason for her being in this situation was that damned package.

She heard shuffling footsteps and the metallic click of a weapon being cocked. "What the hell did you do that for, Charlie?" a gruff voice asked from the mouth of the alley. "Jesus, we weren't supposed to kill her."

"Pis off, Jake" the other one mumbled. "It's money in the bank if we nail her."

Five minutes earlier the two had followed Beryl to the florist where she'd been told that the package would be waiting. Philip had instructed her to say that she was there to pick up a "bouquet of white and purple roses." The code word seemed so damned silly, like something out of a spy movie, she'd thought at the time. But she'd never met any of Philip's dealers, so there was no way of knowing if this sort of dialogue was normal. It would be just like Philip, a lit major, to dream up this sort of stupid game.

But the florist had nodded wisely when she spoke the code words and handed her a tightly wrapped package. She handed over the envelope containing Philip's cash. The florist grabbed her arm and pointed to the side door as she was cramming the package into her backpack. Beryl glanced to the front and saw two men looking through the window. They didn't look like customers who would buy a rose for their mothers, not hardly!

"Hammer's men," the florist said quickly without further explanation and opened the side door. Beryl didn't wait for an explanation, she was already over her head. She stepped into the alley and looked right and left, unsure of which way to go. She started running to her left, hoping that way would lead her back to her ride.

Before she had gone twenty meters, the two men followed her through the doorway, all fury and anger, judging from their shouts for her to stop. For the briefest of instants she wondered whether they were government or thugs.

Either way she couldn't stop; Philip's package was too implicating, too dangerous.

Now, crouched in the courtyard, she knew more about them. The shot told her that they weren't g-men—they were something worse. "Hammer's men," the florist had said. Who the hell was Hammer?

Beryl inched along, keeping herself in the deepest shadows near the wall and hoping that she wouldn't stumble over a pile of unseen trash. *Let there be some way out of this*, she prayed and took another careful step. Then one more, and another.

Behind her she could hear the two men as they drew near the spot where she'd been hit, looking for her body, no doubt. *God, I hope they don't have a flashlight*, Beryl thought as she neared the corner and safety.

Suddenly, the courtyard was blindingly illuminated as overhead floodlights flared like six bright suns. When the light came on Beryl threw her arm up to cover her eyes, wincing with the stab of pain

from the injured shoulder.

"Hey, what the hell are you guys doing down there?" a man challenged from a window somewhere beyond the glare.

Her two pursuers growled some curt reply, apparently as disoriented as she from the blinding light.

Beryl took advantage of their momentary distraction and ducked around the corner. She started running as hard as she could. *God*, she thought, *I hope I'm heading in the right direction!*

A few seconds later the alley led her onto an empty parking lot. There was a chain across the lot's entrance and, at the curb, near the corner, was her waiting truck, its emergency lights flashing.

Beryl wasted no time leaping the chain, throwing open the truck's door, jumping inside, and shouting to the skinny, nervous driver. "Weed, get going! Hit it!" She struggled to close the door as the pickup's tires screamed their escape into the night.

"Was that a gun going off back there, B?" Weed asked with a worried glance into the rear-view mirror. "What are you getting me into?"

Beryl sat back and rubbed her bruised shoulder. The feeling was starting to come back and it started to hurt like hell. She wondered if the bullet's grazing impact had fractured her shoulder. Damn, but it really, really hurt!

"You're not going to get into any trouble, Weed. I just had a little problem back there. Nothing to do with you," she told him through gritted teeth.

"You said you just had to get a package from someone. You didn't say you were going to shoot somebody!" Weed twitched on every other word, throwing a worried look in her direction.

Beryl fumed; Weed could be so tiresome. "I didn't shoot anybody," she explained harshly. "And that noise was probably just a backfire. Nothing to do with me, anyhow. I was just running because the city at night always scares me."

Weed nodded vigorously. "All right, all right!" He sounded as if he believed her. Apparently he hadn't seen the two men running out of the alley behind them, shaking their fists at the departing truck.

"Drop me off on campus," she told him. "I need to pick up my bike."

"Right. All right!" Weed replied. His twitching died down somewhat as he concentrated on steering the truck through the dark streets.

Beryl tried to relax, but the throbbing pain in her shoulder wouldn't let her. She worried about how she was going to ride her bicycle with a possibly broken shoulder. It would be agonizing, but that was better than letting Weed find out where she lived.

Such caution reduced her risk. It kept the number of people who had such knowledge to a minimum.

The affair had started with a number left on the private line Beryl maintained for her business messages.

The woman who answered at the number had a faint accent that Beryl couldn't immediately place—was it Spanish, or perhaps Portuguese? "Can you help me?" the woman asked when Beryl identified herself with her code name.

Beryl pinched her lower lip between thumb and forefinger in thought. She wasn't sure that she could trust the woman at this stage. It would take a little careful probing to determine if she was a

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legitimate customer or not. Beryl lived with the ever-present suspicion that every new client might be a plant, another lousy junior g-man trying to catch another splicer to pump up his resume. Felice, her main go-between, wasn't always so careful when he smelled a big payment.

"Why did you think I could help you?" Beryl replied innocently, playing out the game, still saying nothing incriminating, just in case.

"Our sources told us that you could work fast, provide high quality product, and" the woman paused, "be discreet."

So far the woman was a typical new contact. "What was the name of my friend?" Beryl asked with her finger on the switch hook. She was glad that she was using a public phone. It was useful in situations like this. If the woman gave the wrong answer, she'd hang up and walk away from the deal.

The woman hesitated and whispered an aside to someone. "Is it," she asked Beryl with some hesitation, "all right to say his name over the telephone? I mean, aren't you afraid that the police might be listening?"

Beryl chuckled to herself. Yeah, like the g-men had nothing better to do than monitor some arbitrary public telephone. Fat chance of that. "Don't worry. The name he gave you wasn't his real one."

"Fleming," the woman said at once. "The man who told me about you said his name was Fleming."

Now *that* was funny! Felice always did have a streak of humor in him. "All right, you pass. What is it you think I can do for you?" Beryl asked. It was always better to have the customer bring the subject up. That way she could always plead entrapment.

After much crap about how desperate she was, it turned out that the woman wanted something very special, a genmod to eradicate the gene that made her family susceptible to Heinteller's Syndrome, a particularly nasty degenerative nerve disease.

"My children would be susceptible to the disease," the woman explained. "Every generation of my family has had at least one case of Heinteller's. I—I mean my husband and I—don't want to pass this trait along to the future."

Unspoken was her fear of the mandatory eradication of the fetus, should it prove to be carrying the gene. Abortion, they'd called it just a generation before. Now it was sane social policy, enforced by required first trimester screening.

"Why not adopt a kid?" Beryl asked. "Why take the risk of an illegal gene modification just to insure that your kid will pass?"

The woman didn't answer immediately. Beryl said nothing as the silence dragged on and on. "All right," the woman finally whispered. "Listen, I *need* to have a kid or my husband will divorce me!"

Beryl wondered if maybe she should refuse. The work wouldn't be easy. Genmods for an embryo were damn difficult. On the other hand, it did present a challenge to her biological skills—a very *interesting* challenge. "I'll call you back," she promised and hung up.

Quickly she dialed another number. Felice answered on the second ring. "This is a primo contact," he insisted when she pressed him on the woman's credibility, "not like that penny-ante shit you deal for the kids. Listen, she heard about what you could produce and came looking for me. Flashed lots of brand new eurobills—five thou to start. But I think she's good for more *if we play her right*," he finished. "Maybe she'll go another thousand or so. I could use the commission, you know."

"Yeah, me too," Beryl added. With a little luck, she might easily clear two thousand, even after covering working expenses. That, added to what she had already accumulated in the bank, would be

enough to buy her post-graduation one-way trip to Cuba. Once she was there she was positive that she could, with her skills and knowledge, land a decent bioengineering job. So she had both benefits in this job: interesting work and top pay to boot.

The next ten minutes were spent forcing Felice to assure her that the woman wasn't a plant, wasn't a government ploy to trap her. "Dig up as much on her as you can," she instructed him. "I want this to be a clean sale—no risk!"

66 **A**ll right. I'm considering doing it," she snapped as soon as the woman answered the phone when she returned the call.

"Excellent," the woman replied and immediately became all business. "I will have the DNA you will use, and the selective codons we've selected for the transformation."

"*We*," Beryl was taken aback by the woman's depth of understanding. "Who the hell is this *we*?" Usually she had to coach clients on collecting samples, walking them through step by careful step. Having the client being conversant enough to supply the materials without prompting was highly unusual. Matter of fact, if she was that sophisticated then why would she take a risk with her, a little free-lance cracker, instead of one of the better equipped MAFIA labs? Didn't she know about the risks?

"Oh, I had someone tell me all about this sort of thing," the woman explained quickly. "She was very knowledgeable."

So there was somebody "knowledgeable" involved in this transaction. Was it the same woman, she wondered, who'd told the woman of her talents? She ran through her previous customers to see if she could remember any with this sort of accent, but came up with no matches. The fact that this was a recommendation gave her some relief but, just the same, she was glad that she'd told Felice to check more deeply into the woman's background.

"I've put everything you'll need in the proper storage containers," the woman continued. "How can I get them to you?"

"Drop it off in the Student Union at University—in the campus coffee shop," she instructed. "Put it on the rack near the door at exactly 0855 hours tomorrow."

That choice of time, as the breakfast crowd was leaving and right between first and second classes of the day, would ensure that there would be maximum confusion in the Union. Beryl could easily blend into the crowd and watch the drop without being noticed. She knew the place well enough to be able to spot anyone who didn't fit. If she saw anyone suspicious, she'd just abort the pickup. Maybe she'd have Weed pick it up for her and deliver it for later. Even safer that way.

No sooner had the woman rung off when Beryl got a call from Weed. "My man needs another load," he pleaded. Beryl could hardly understand his thick, raspy voice, his congestion was so bad. "He wants some *good* stuff—you know, *guaranteed*! They got *spooked* over that Lewis kid's OD last night. You *know*, the *football* guy."

"Todd Lewis?" Beryl exclaimed with a shock of recognition. "Was that why the ambulances were over at the jock's dorm?"

"Yeah, he took a *double nostril* and flipped. *Knife*, I heard."

The news of the Todd Lewis' death hit her hard. He'd been in one of her classes last year; big guy, black hair, and a wicked grin. He certainly didn't look like the type to binge on mods, but then, who did? Damn, what if that happened to one of her customers—would that make her at least partially responsible for their addiction? For their suicide? She *knew* that it shouldn't; but couldn't shake the

Beryl's Run

guilty feelings. She promised herself to kick in a few euros for Todd's memorial wreath, but didn't think it would help her conscience much.

"Sounds like you've got a bad case of sniffles," she said, as she brought her thoughts back to Weed. "You got another head cold?"

The Weed sniffed loudly. "You *know* how it is, B. *Stuff* gets around. Come on; I've got the down payment." His voice cracked on the last word, which made her suspicious about his true condition.

Maybe he did have the money, maybe not; Weed had stiffed her before, several times, in fact. Eventually she got it back, one way or another—running her around in his truck was one of the ways Weed repaid his debt.

Running the risk of arrest at the Union pickup would be another.

Weed was usually a dependable resource for running her errands, provided he hadn't, and didn't, have his lungs stuffed with some crap. Once he took a sniff there was no telling when she'd see him next, or in what condition, and to hell with whatever she'd asked him to do.

At one time he had been one of the best, cracking genmod splices that were way over the top. But he'd succumbed to the enzy lure after a batch of weird had sent a dozen of his customers to the hospital—quality control was not Weed's strong point—and most had died, or went hopelessly insane. After that he'd stopped cooking for anyone except himself. Eventually he couldn't even do that anymore.

Since then Weed had sniffed so many lungfuls that his edge was gone, along with most of his memories. Even on his best days his mind seemed to be muddled, thanks to his much-modified glands that secreted God-knew-what juices into his brain. Despite his addiction he'd managed to hold on to enough rationality to manage a small distribution business. Beryl was his OEM source. One of the few who were careful with the quality.

"Beryl, I'm in a *really* bad way," Weed continued to plead. There was a note of desperation in his voice. "I gotta make some sales, and *quick*, to cover some of my recent *buys*. Listen, I'll give you *ten* more points this time. That's, uh, let's see, uh, *30 percent*?"

Beryl was tempted by the offer. A 30 percent share of the profits would be nice, for sure, *if* Weed could come through with the cash. "All right, all right!" she relented. "I'll run you another batch. I can have it ready for you tomorrow, at about twenty-one hours."

"Twenty-one *hours*? Uh, that's *nine* o'clock tomorrow *night*—right?" From his hesitation over the time and the querulous tone in his voice she knew he was coming off of something. Weed would probably find it hard to concentrate if his mind was being yanked in different directions as his doses wore off.

"Listen Weed, do you want me to fix you something?" Beryl added sympathetically.

Weed hesitated. "Sure, B. You *always* know what I *need*. I need *help*. This one is *bad*, real bad! *Yeah*, I could use something—*please*?" The anguish in his voice was too damn much. What had he blown up his nose that wouldn't let him go? Weed coughed into the phone. His sniffles became more apparent.

Beryl considered what she had in inventory. She'd engineered some CREB mods earlier in the week. Then there were a few pituitary boosters; some melanocyte adjustments for a grad student who couldn't afford the time to soak up the sun's rays to get a tan the honest way, and the progesterone mod for one of the frosh. She could make Weed a quick hit of neutral adrenal enzymes. They would scrub his system enough to hold his demons at bay until he could get some medical help, that is, if he had the nerve to go to the dispensary.

After a moment's reflection she doubted that he'd do that. Weed wouldn't risk being nailed as a sniffer. The campus docs were notorious about informing the g-men on their students, since the reward money was so good. Only a bigger bribe kept them quiet, and Weed wouldn't pay that sort of cash payment if he could make a buy instead.

Beryl continued to consider the delivery method she could use. Weed's 'cold' presented a problem, because she usually used the lungs as an entry point for her tame *myoxylis vulgaris*, the lab-grown virus that had become her favorite transport tool.

M. Vulgaris was gorgeous: she could transform the virus' front end with the right ORC to go after any specific codon on the genome, and pack the restriction enzymes—molecular scissors—and a codon replicator on *vulgaris*' tail. Best of all, *vulgaris* was easy to maintain—a few agar dishes of their favorite *escherichia coli* host and a little heat kept the virus happily replicating until she needed to harvest it.

Sniffers favored the lungs as the point of entry. It was easy to load a few jillion virus-laden bacilli in a nasal spray, push it up your nose, and sniff it into your lungs. From there on the critters would enter the bloodstream and migrate to the selected gland, where they would modify the gland's secretions to produce some witches' potion that would take the sniffer to heaven. Or hell, which was where Weed was going to be very soon if he didn't get his habit under control.

"When was the last time you had a medical?" she demanded.

"Uh, a *month* ago," Weed obviously lied. "You guessed right, B. Sure, it's *only* a damn *cold*. I'm in *great* shape . . . considering the *shape* I'm in." He giggled at his own sick joke.

"All right," she sighed, not amused by his gallows humor. "Meet me tonight and I'll give you something to clean you out."

She wondered which mix Weed had sniffed this time. If it wasn't for her periodic help with the cleansers, the poor snot would probably be decomposing in some ditch by now, his glands pumping out exotic secretions dreamed up by some demented splicer who didn't give a damn about quality.

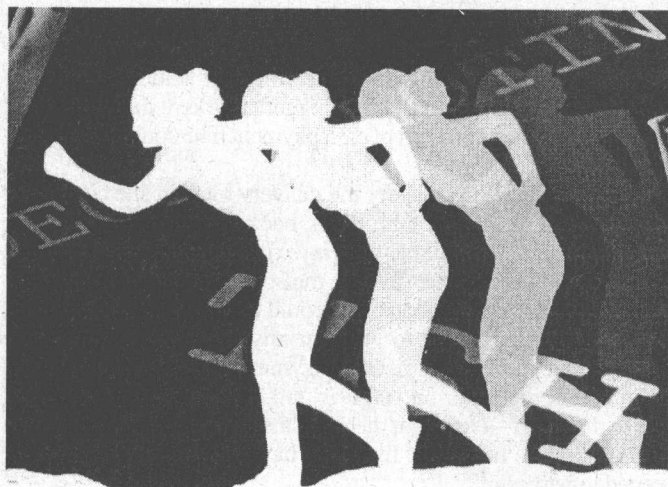
That was the problem with this business. Without a decent lab you couldn't check what you were buying. Transactions depended on trust in your suppliers. Cutting the dosage was a frequent way of expanding profits, as was selling drug-laced substitutes to the unwary. Hard to tell the difference in effects from a good gland job. Both made you feel good, but the drugs were detectable, and grounds for arrest. Beryl was very careful about quality—she didn't want anyone's death on her conscience!

Beryl wasn't sure why she helped Weed. The same guilty conscience, she supposed, or maybe it was just mistaken friendship or protecting one of her distributors? Who the hell knew—she surely didn't. But Weed gave her good markup, and that added to the funds she needed to bribe her way into Cuba and a decent life.

Running her splice operation was both illegal and dangerous. For one, there was always the chance of being raided. Of course, the poorly funded gene police couldn't keep up with *all* of the underground bio-engineers. Shoot, they were lucky to nail the occasional cracker who thought it great fun to spread some great new disease around, tagging a flu bug for fun. Kids! Why the hell did they do something like that?

The g-men's limited manpower forced them to concentrate on the big-time distributors and the industrial-strength splice operations who could afford scanning electronic microscopes, computer-controlled incubators, variable micro-centrifuges, and all the other sophisticated stuff that was far beyond her modest means. The large

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MAFIA operations managed to keep the g-men occupied, but that attention seemed to have little effect on their operations.

It was the very rich who supported the illegal MAFIA labs. The very, very rich could afford to take a nine-month vacation in some remote place, somewhere with more relaxed screening. The resulting “vacation kids” were privately schooled, escorted everywhere, and kept out of sight from the populi. This concealed the fact—from practically no one with an ounce of sense—that most of the kids had been genetically modified. The politicians seemed to ignore the trend, so the way things were going, in another generation the rich meritocracy would be smarter, faster, more resistant to disease, and probably stronger than the average taxpayer.

Technically, Beryl was in violation of GPA-02, the Genome Protection Agreement of 02, which forbade anyone from messing with their genes without a US government stamp of approval and sixteen-jillion medical signatures. After the neo-cholera epidemic of 01, which some suspected as being caused by runaway bio-research, the Fundamentalist Government had declared uncontrolled bioengineering as too dangerous, too radical, and probably against the will of God, Allah, and Mohammed. Only government-certified labs were allowed to do genetic research, and that under very tight control. The result was that there was nearly zero creativity or advances in the field. The fundamentalists rejoiced while the scientists cried.

Since the passage of the GPA-02 anyone who altered the natural selection of the human genome without a government stamp was liable for a stiff fine, a lifetime in prison, or both. Needless to say, the products of any such discovered efforts were destroyed—tough on the parents who got caught and harder yet on the resulting kids. As always, the rich got away with crimes that sent lesser folk to jail. Messing around with the constituent parts of an existing human being were causes for lesser punishment.

Sometimes she hated the stupidity of the populi so much that she could scream.

Most of her customers were those who wanted some unique and illegal bio-mods: adrenal production genmods—to help boost athletes’ natural steroid production, or the pituitary genmods, like oxytoxim and TSH, purchased by students with more money than brains who wanted to screw ’til they dropped. Hell, most of them could afford to bribe the campus docs to do a reversal when they got bored, or caught. Her most profitable stock in trade was the stuff that

Weed wanted—happy-go juice. Everybody bought some during their stay at University.

“How are you doing in school, Beryl?” Mrs. Williams asked as they passed in the hall. Helen Williams was a sweet, pert little thing with a twinkle in her eye. This morning she wore a tight-fitting suit and had her blonde hair tied back into an Evita. It went well with the rich tan she got from that last shot of tyrosinase Beryl had cooked up.

Helen was nice. She let Beryl have the room rent-free in return for monthly doses of deoxyglutinate, an enzyme that produced a flood of ISCH, the hormone that helped the body produce testosterone. Dear, sweet Mrs. Williams slipped the doses into her husband’s drinks.

“Fine, I have a workload this semester that really keeps me hitting the books.” Beryl replied with a grimace to show that she didn’t enjoy the hard work.

“That’s nice, you’ve got to spend more time studying instead of messing around in that workshop of yours. I’m always afraid that your, uh, hobby will affect your school work.” Mrs. Williams’ heavy perfume swirled around Beryl’s head. From the bite in her nostrils she recognized it as one of the pheromone-laden ones that had just come on the market. Were Beryl a man she would probably be thrown into high heat from just that brief whiff.

“Don’t worry. I won’t neglect my studies, Mrs. Williams. I know how important it is to get a degree.”

“Well, I’d like to talk some more, but I have to run downtown to meet . . . an old friend,” Helen said, flashing a forced smile. Her spike heels rattled on the hallway tiles as she headed for the front door. “When my husband comes home tell him that I’ve gone, oh, shopping,” she said with a dismissing wave of her hand.

“Sure,” Beryl repeated, “shopping.” Apparently the deoxyglutinate treatments weren’t helping Helen’s problem. Either that or Mr. Williams hadn’t been thirsty enough for his wife’s tastes.

Beryl wandered over to the garage and climbed the ladder. Her tiny laboratory fit neatly into the one corner of the attic that wasn’t filled with the Williams’ junk. A work bench ran along one side of her corner. Two shelves were built above the bench, one crammed with books and the other full of bottles and cans labeled with her scrawled handwriting.

Beneath the bench were three sets of drawers, each crammed with glassware and supplies that she had either bought or filched from the laboratory at school. In the middle of the bench a goose-necked lamp, stained hot plate, beat-up old centrifuge, and a much-abused toaster oven were plugged into a power strip. She’d checked the box downstairs to make sure that the power strip was on the forty amp leg and not one of the twenties. She’d hate to blow a breaker when she had something cooking.

Beryl ran a bare-bones lab. She’d bought the hot plate and toaster oven at a yard sale and rigged the bank of incandescent lights—which presently warmed the ten neatly labeled petri dishes of *e coli* beneath them—from an old chandelier. There was also an illegal, very-much-used microprobe and Weed’s beat-up centrifuge. The latter were partial repayment of one of Weed’s early debts.

The probe let her sequence codes at the gross level, enough to jigger together the goods her customers needed. She couldn’t engineer a new baby’s DNA to spec like the big labs, but she could do most other things. Her strength was the art of splicing, not codon engineering.

The rack of stoppered test tubes sitting in plain sight looked quite innocent. One test tube was labeled “Skin cream” and the others “Emollient,” and “Aloe.” The labels were a bit of misdirection, just

Beryl's Run

in case Mr. Williams got curious about the potions she cooked up for his wife.

Most of the populi imagined that bioengineering was some scary, arcane science requiring high-tech gear such as electronic scanning microscopes and the like. Those sophisticated things were useful, but Weed had shown her that the grunt business of modifying a code sequence was nothing more than cooking: You take one cup of nutrient, slowly add a tablespoon of bacteria, stir lightly over a low heat, and then throw in a dash of virus that had been steeped in the desired enzymes for a few hours. After an hour or two, depending on the mix, you strained the soup, remove some live bacteria, separated those which are not infected by the virus, and decant the rest into a small tube, which you deliver to the client.

It was about as hard as making good soup.

She pulled a sterile needle pack from one drawer and drew one cc of the "Aloe" into a hypodermic syringe's cylinder. She fished a brand new styrene inhaler from her back pack. With slight pressure she slid the tip of the needle through the plastic wrap and into the bottle. Then she injected the fluid. When she was done she heated the needle with a match as she carefully withdrew it. The heated needle would seal the plastic behind it so that the inhaler would look untouched, just like you'd picked it up at the drugstore.

Beryl flushed and rinsed the syringe before putting it back into the drawer. She dropped the inhaler into her pack and returned to her room. It would take a few hours for the bugs to grow to usable numbers.

An hour later she'd finished her assignments and was back in the lab, preparing the batch of happy-go that Weed had requested. It was fairly simple, as these things go.

The happy-go's viruses modified the pituitary to deliver an array of enzymes that would scramble the brain's signals. The effects of the happy-go were random memory associations raging in a storm of sensation and impression. The mix produced the occasional orgasm as well as twenty other sensations that Weed and his fellow sniffers had never managed to explain to her satisfaction.

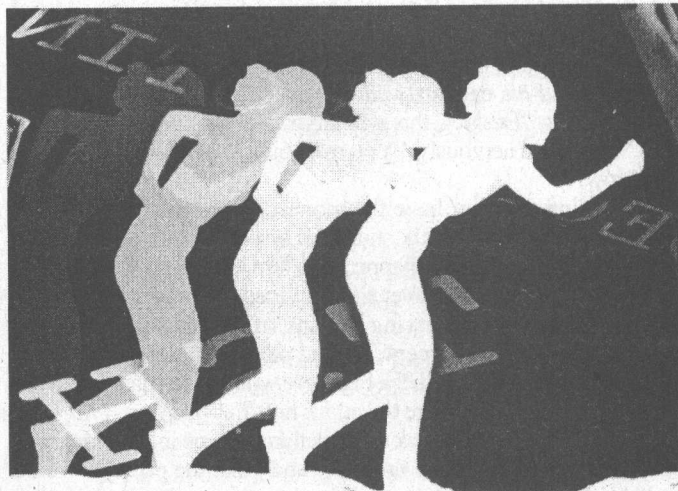
"You have to try it to understand," Weed insisted when she'd expressed curiosity, but she'd always refused the offer. It was one thing to cook up the stuff, but quite a different matter to mess with your one and only brain just for a few hours of unfettered joy. That was the path that Weed had taken after his disaster and one she didn't want to follow. She'd never get to Cuba that way, never get out of this stinking backward country.

She'd been tempted to sniff. But just once, when she was really low. Some of her friends had died of the Canadian flu that a decent gene modification would have cured, had it not been for that fatal 02 law. Maybe some day, if things got really, really bad, she'd sniff some happy-go. Then again, maybe not. It was her only brain.

She always added reproduction restrictors to the viruses she sold. That kept her genmods from becoming permanent fixtures in someone's brain. At best, her sniffers would get a few hour's worth of pleasure before their glands reverted to their normal state. But that was fine—all that Weed's customers wanted was a few hours of fun, not a permanent trip on the joy express.

As she worked she listened to the afternoon news-tape. It was the usual crap: fifteen minutes of local, ten of national, and the rest of the bloody-be-damned world news in the last four, with a one-minute weather report as the cap. The local was full of another bio-materials bust in New Jersey. A MAFIA warehouse this time.

The international headline for the day was the fight between the British monarchists and the Republicans. The queen-regent had



decided to give birth, using the frozen sperm her recently departed husband, the king, had thoughtfully deposited before he disappeared in a cloud of flaming plastique that the Republicans had snaked into his toilet from the sewage system.

Elsewhere the Chinese were reportedly discussing embarking on massive genetic cleansing of their population. As a result, the Greater European market was in a panic, while Japan was rushing automated testing equipment across the South China Sea.

It was going to be clear tomorrow with a 40% probability of rain in the late afternoon.

She looked around. There was nothing more she could do this evening. She turned off the goose neck, locked the garage door behind her, grabbed her bike, and headed for the library to drop off the inhaler she'd prepared for Weed.

Weed looked terrible. He was emaciated, pale, and jittery. His hands were trembling so hard when she handed him the inhaler that he nearly dropped it. He reached into his pocket and pulled out a wad of crumpled and dirty bills. "I think there's fifty there," he said, pressing the wad into her hand. "I'll have the rest of the cash tomorrow night. I promise."

Beryl raised an eyebrow. "You sure?" There was something about Weed that didn't seem right. What was it?

Weed shook his head vigorously, which set off a spasm of coughing and wheezing. "Yeah," he said, gasping for breath, "I will have some cash, unless, uh, something comes up." His eyes slid to the side when he said that.

"Weed," she said, drawing his name out. Weed absent-mindedly picked at the plastic seal on the inhaler with a dirty fingernail . . . That was it! "Did you sniff something since I talked to you?" she demanded. "I swear, Weed, don't you remember how dangerous it is to double up? Damn it, you were supposed to wait until I could clean out your systems before you tried anything else!" she added.

Weed waved his hands aimlessly in the air, still looking to the side, avoiding her eyes. "Hey, no problem, B. I can handle it. Was just a new happy somebody let me try. Nothing serious. Recreational, he said."

"There's no such thing as 'just recreational,'" Beryl objected, anger giving heat to her words. "Damn it, you know as well as I that those are live viruses you're sniffing. Didn't you think of how those things could interact when they give your body conflicting signals?"

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What's going to happen if they both start sending God-knows-what messages to your glandular systems?"

Weed looked at the ground and shuffled his feet. "Wasn't a big sniff, just a *tad-bit*, enough to *tide* me over. I can *handle* it." He held up the inhaler. "Besides, this will *clear* it all up, like yours *always* does." He smiled nervously. "You *still* going to *deliver* the happy-go tomorrow?"

"Providing that you have the money," Beryl said mercilessly, hoping that he would balk, that she would be absolved of the responsibility for whatever happened to him. She knew that he'd sell part and sniff part of whatever she delivered—which would put his brain on hold for days, driving out any of the residual devils that haunted him. Thirty percent, he had said, but did she need the money that badly? After all, the big score with the woman would put her over the top. What were the ethics here?

"Listen, I need you to pick up something for me in the morning." She quickly described the drop site and what the package would probably look like. "A woman will be dropping it off—don't let her see you," she advised. Weed nodded that he understood. "Write the time and place down so you don't forget," Beryl warned and watched as he did so.

"I'll get it," Weed promised as he shoved the slip of paper into his pocket and shuffled through the library doors into the night. Beryl bet herself that he wouldn't take the seal off the cleaner until the final vestiges of his last sniff wore off. She sure hoped that the steroids helped. Damn, didn't these sniffers fucking *care*?

Beryl rushed back to her garage lab after getting the Union drop from Weed. She whistled when she opened the woman's package. She had been right about having the help of some knowledgeable person; whoever had prepared these samples had been paid some serious money.

The samples were stored in top-of-the-line cryogenic containers to keep them from decaying at normal temperatures. The sets of codons were sealed in foil packs, typical for crystallized viral forms. Each pack was labeled very clearly, in a neatly scrolled hand. Quite obviously, there was some major money behind this job.

As she was considering what that sort of money implied, Beryl put a bit of each sample into a tube and bathed them with a couple cc's of Wigler's solution. The Wigler's would break down the cell walls and free the nucleic acid so she could run the polymerase multiplication.

While the Wigler's was working, she started to build the factory where she would manufacture the viral DNA surgeons. She sterilized a dozen petri dishes in the toaster oven. It only heated up to about 350 or so, but that was hot enough for what she needed. It wasn't as if she were baking a cake.

She prepared some broth while the dishes were being sterilized. By the time the nutrient had cooled, so too had the dishes. Beryl poured the sterile broth and carefully placed the covers over each dish to prevent airborne infection.

As she was preparing the calcium carbonate and distilled water solution she wondered why the woman came to a campus splicer like her instead of contacting one of the larger, better-equipped MAFIA labs? She poured the mixture into two micro-centrifuge tubes and carefully stretched a sterile cap over their mouths. Maybe the MAFIA wouldn't handle a little job like this.

Beryl rummaged through the upper shelf and pulled down three bottles, each one full of thick liquid. Beryl selected the one containing the DNA primers and charged a hypodermic with one cc

of the milky fluid and three of the polymerase then put the sample tubes in Weed's old 99 Packard Supreme centrifuge and twirled them for five minutes. When she took them out the solution with the woman's samples had separated into two bands, some yellow fluid at the top and a wad of white gunk in the bottom. Between the two was a thin layer of clear liquid. She drew off most of the yellow fluid from each sample with a micropipette and dumped it into a beaker. With great care she inserted the tip of a hypodermic into the center of the clear fluid and withdrew half cc, which she injected into the tubes containing the calcium carbonate mixture, followed by one and a half ccs of the primer and polymerase mixture. She shook each tube gently and placed it in a holder. In a day the polymerase chain reaction would multiply the DNA in the samples a few million-fold.

Yeah, she concluded. Maybe the MAFIA labs had their own risk for the woman. Maybe she was just ignorant of how to get in touch with them. Who knew? It was just her luck that she had managed to find Felice instead of somebody else.

To get the information she needed about the codon's location, she had to tap an underground Berlin node, which meant that she had to relay through the commercial links, which cost her a bundle. Beryl hadn't used her far-cheaper school account to link to the NIH library since she'd learned that they were routinely monitored—part of the program against splicers like her.

A bit of research on the node told her the codon's coordinates, which only told her where on the DNA helix she would find the code that controlled Heinteller's. It took a lot more digging to discover the exact nucleotide sequence that would identify where she should cut the strand to replace the codon with the one the woman had sent.

Beryl looked at the description on the screen and considered; she'd have to use something with a close match to cut that part of the strand and not affect the nearby strands. That meant she had to use some specialized enzymes. Which required a quick call to Philip—he was the only supplier who could get them for her quickly enough.

She debated calling right away, and then thought better of it; the less telephone chatter between them the better. She'd tell Philip what she needed the next day, during their class in Government and Ethics—one of the required courses they shared.

She listened to the news over a breakfast of bagels and coffee. There was more news about the bio-materials warehouse bust in Jersey. The driver was providing valuable information, they said, that would certainly lead to the breakup of the smuggling ring.

World news had no more about the British mix-up, but quite a bit about France's declaration of economic boycott against China. There was a rumor that the rest of Greater Europe would follow their lead.

The forecast for rain that afternoon was 20%.

Philip, her supplier, had been one of her lab partners in high school chemistry. Weed was the other one. Philip had somehow managed to establish a solid connection to wherever the underground bio-materials were produced. She'd heard that his distributor smuggled the stuff into the US through Mexico and brought it up the river. But that was only a rumor; Philip never disclosed his true source.

Philip whistled when she told him what she needed and quoted a thousand, minimum. "The g-men have been making distribution very tough. You heard about the bust?" he said by way of explanation, looking around to make certain that they weren't being

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overheard. Most of the other students in the G&E class were either asleep or cramming for their next test as the lecturer continued to read his prepared notes without looking up.

Beryl nodded to indicate that she'd heard. "The warehouse in Jersey? Yeah, I heard. The news-people had a blast with it, pumping out the godzilla and giant tomatoes scare routines. The way they talk you'd think that the populi's stupid babies would sprout horns and their dogs and cats turn into monsters if this stuff had ever reached the street. Shit journalism, like always."

"The g-men probably overestimated the street value of the stuff," she added. What she'd heard was probably an obscenely exaggerated value. Maybe that was why Philip wanted so much—he'd gotten an overblown idea of what she would be willing to pay.

"I can't afford a thousand," she said flatly. "Maybe I'll try somewhere else."

Philip shrugged as if uninterested. "You got nobody but me can deliver this fast, Beryl. You know I wouldn't screw you on price, but I gotta make a profit. There's a big risk every time I make a buy. The rooting g-men are everywhere these days. I've probably already done more buys downtown than was healthy for me."

"I'll give you a six-pack," Beryl responded, waving her cash card. "Six hundred should be enough."

"It's a thousand," Philip repeated adamantly. "Six hundred won't even cover my costs."

"I don't have that much. The job only nets a lousy two kay, and I have to pay my agent. If I pay a thousand I lose half my margin. Come on, Philip, I'm a good customer, an old friend. Cut me some slack!"

"Maybe if you do me a big favor," Philip said slyly and smiled at her.

"No way!" Beryl replied hotly and felt her face flush. Philip had been trying to get into her pants ever since high school. She recalled biology class, when he'd cop an occasional feel, but that was all right because it kept him happy and her in a good supply of the lab stuff he lifted from his dad's warehouse and passed on to her.

Philip's dad ran a trucking concern, hauling hospital and medical supplies. Philip would get her a case of ehrlenmyer flasks here, a pack of syringes there, and pretty soon she'd had a nifty little setup at home where she could play with her little bugs and wigglers, all for keeping the fat kid happy and in spending money. She hadn't let it go beyond that then, and she sure as hell wasn't going to do so now!

Philip blushed. "Aw, that's not what I meant, Beryl. I just need someone to run into the city and pick up, uh, some stuff." He fidgeted for a minute, scuffing the classroom floor with the toe of his expensive Italian shoe. "Look, I can't go down there myself. Like I said, I might be recognized if I go too often. Nobody knows *you* from squat. You'd be safe. If you do that for me I might be able to come down on the price. Time is money, you know. I'll pay to avoid risk."

Beryl hesitated. She was anxious to get the enzymes she needed at a price she could afford, but she wondered why Philip *really* wanted someone else to make the pickup. He usually kept his sources a closely-held secret. "How much of a markdown?" she asked bluntly.

Philip screwed up his face, as if trying to work out the proper price in his head—he'd never been good at math. "I'll let you have them for eight hundred. That cuts my margin to the bone."

"Seven hundred is all I can afford," Beryl stated flatly and watched his face as he struggled with the counter offer. That was a stretch. This pickup would have to be pretty important if it was worth three hundred to him. Damn important!

"All right," he said at last. "But no questions, you hear me. Just pick up the package tonight and bring it to me."

"Done," Beryl said and handed him her cash card. "Now, where do I have to go to get this package you want?"

That was when he told her about the florist, but he didn't mention that she just might get freaking shot!

She didn't wait to get home before calling Philip. "What the fuck have you gotten me into?" Beryl screamed from the pay-phone near the bike stand. "Two guys took a shot at me as soon as I got the package. Damn it, Philip, I could have been killed! Why the hell didn't you tell me this was going to be dangerous?"

Philip didn't answer immediately. Perhaps, Beryl thought, he was trying to think up with some excuse that would satisfy her, something that she might accept as the truth. "Come on, you fat little turd, tell me what is going on?"

"I... I didn't know that there would be any trouble," Philip said, his voice quivering noticeably. "It was just a regular pickup, like I said. Maybe they were g-men," he suggested.

Beryl considered. The government agents were a rough bunch, but she was certain that they didn't have shoot-to-kill orders. No, these guys were definitely not g-men. "Your florist friend said they were Hammer's men. Who is Hammer?"

"H—Ha—Hammer? Are you sure? Jesus! Listen Beryl, I don't think you'd better bring the package to my place like we planned," Philip said nervously. "I don't want to get involved."

Beryl fumed. It was just like the fat little prick to leave her sitting high and dry, holding the bag. "Listen," she said, putting as much venom in her voice as she could muster, "I am going to deliver this freaking bouquet of roses and you will," she continued menacingly, "get me the enzymes you promised and give me a God-damned discount! You hear me, Philip? I am not going to pay seven hundred fucking dollars for the privilege of getting my ass shot off!"

"All right, six hundred, your first offer. But don't bring it here! Let's meet at the Union, in the dining hall, tomorrow, at lunch."

"No, damn it; I'll flush your package down the toilet before paying that much! If you want to see your package you'll sell me those enzymes for what I think is reasonable—four-fifty, tops! And Philip, do you know what else?"

"No," he replied, the quavering note in his voice told her that he had conceded defeat. "What else?"

"I am *never* going to do you any more favors, not now, not tomorrow, never. Do you understand? After lunch tomorrow I don't even want to talk to you again!" With that she slammed the receiver down. Hard!

The Wednesday morning local news still had the Jersey bust as the top item. This was just the tip of the iceberg, the announcer assured his no-doubt apprehensive listeners. He went on to declare that agents were presently tracing the web of connections that brought millions of dollars of illegal bio-materials into the country every week. A confidential source, the announcer continued mysteriously, had revealed that the government was on the brink of arresting the kingpin himself, that evil son of Satan who was causing so much disaffection and trouble among the country's youth.

Of course, Beryl mused as she recalled the blank faces of her fellow students, it couldn't be the lousy job market, the burdensome taxes, and the fact that, thanks to the regressive Fundamentalists who had seized the government, the good old US of A was rapidly

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heading toward third-world status. That's what made everyone in her generation so damned mad.

But, according to the press and the politicians, the source of all their troubles *had* to be those evil outsiders, those crooks, those *sinful* foreigners. It was meddling with things man was not meant to tamper with that would bring retribution down on those who did not heed The Word. It was the evil biologists and those who supported them that were the source of all of society's ills.

But anyone with half a brain knew that most of the populi were genetic dinosaurs and doomed to fall behind in the human race for evolved godhead. Common knowledge among those with half a brain was that other countries were quietly cultivating their own modified kids, husbanding the changed, protecting the perfect ones for their own purposes. Meanwhile, in the US of A all but the very wealthy were forced by law to carry the outmoded baggage of their sloppy genetic heritage. Was it any wonder so many kids wanted to opt out, to taste the joy, to genmod themselves with bootleg enzymes to dull the pain of reality, of a future without hope?

Beryl concluded sadly that the cops had as much chance of finding the kingpin as they did of putting brains into a politician.

In world news, Israel had condemned the French insult to the Chinese hegemony and joined the Japanese cargo lift. Germany was sending their own testing equipment to China and Britain's Queen-regent had gone into seclusion.

Rain was out of the forecast. Clear skies and cooler temperatures were predicted tomorrow through the weekend.

Philip exchanged packages with Beryl, as arranged, during the lunch break between her Calculus and Quantitative Chemistry lectures. He tried to start a conversation several times as they ate, but she hadn't responded. After his fifth attempt she mutely pointed at the ruins of her backpack, hanging like a dead crow from the back of her chair, to shut him up. Actually, she would have liked to rip off her sweatshirt and display the huge blue-green bruise that covered her shoulder, back, and upper arm. That might make Philip understand why she wasn't in the mood for small talk.

Earlier that morning the dispensary had told her that the "fall from her bike" hadn't broken any bones and that trauma and bruising were normal. She wasn't to do any more downhill biking, they warned, and she was damn lucky not to have broken something. She shouldn't try such dangerous activities, they advised.

If they only knew!

Beryl finished her lunch in silence, picked up Philip's brown bag when she was done, and casually tossed it into her pack. Philip put the remains of his sandwich into her bag and stuffed it into his own briefcase. To anyone watching the exchange wouldn't have been noticeable.

Once she was back in her garage lab she opened Philip's bag, took out the vials of enzymes, and set the tiny tubes on the workbench. One of the tubes went into the oven to activate at a low 115 degree temp. The others went into the rack. While the first was cooking she got out the rest of what she needed.

Philip's sources turned out some wonderful, high-quality enzymes. Half of their transport viruses were already modified to accept the nucleotides she'd selected. None of their viruses carried the marker introns that WHO insisted all manufactured life forms carry. The introns didn't figure in any protein production and weren't messenger RNA, but reproduced along with the rest of the RNA. That made them an excellent trade mark/identification.

Not that it was a problem. Weed had shown her how to diddle with the introns so they couldn't be traced back before he was on the sniff. Beryl could easily make it impossible to determine the virus' provenance with a few simple steps. Make them look like random RNA trash and therefore untraceable.

The oven chimed. She picked up a titrating bulb, drew a few drops of the viral extract, and put it in a solution with some fresh *E. coli* and shook it vigorously to infect them.

She took a sample with a pipette and wrote a big "A" on an agar dish. Beryl repeated the process several times until all the dishes were loaded with infected bacteria. Then she put the dishes side-by-side into one of the black planting trays she'd borrowed from the Williams' garden and slid it under the warm heat of the forty-watt bulbs. It would take at least a day before the colonies grew large enough to be harvested.

She turned out the overhead lights and went down to have dinner before heading over to the Union to deliver Weed's load of happy-go.

Beryl hardly recognized Weed. He'd changed into a clean shirt and even shaved. Crap, he almost looked like a normal student, for a change. Apparently her steroids had done a great job.

"What's up? Job interview?" Weed had already spent six and a half years at college. He was certainly well past any normal graduation date and certainly unemployable.

"Your sniff worked real smooth," Weed replied with only a trace of huskiness in his voice. "Changed my luck, too. Some guys wanted some information and were willing to pay the price. Look good, don't I?" he finished, twirling around. "The new me, solvent and clean."

"So maybe you don't need what I've got in my pack?" she teased. "Maybe I should take it over to the Union to see what I can get for it, retail."

"N—No!" Weed shouted. All at once he wasn't the calm, cool, student anymore. Now he was the shaking sniffer, reaching out with claw-like hands toward her, as if he were a penitent beseeching her for a blessing. "I've got the money," he said and quickly pulled a thick pack of notes from his jacket, peeling off a few thousand and handing it to her. "Here's *all* of it. Your 30 percent!"

"Where the hell did you get so much money?" Beryl said even as she accepted and counted it. She tucked it into her pack and passed the packet of happy-go inhalers across.

"Like I said, guys needed some information," he said obliquely and hastened away with her package under his arm.

Beryl wondered what sort of information Weed had that would be worth so much. The g-men certainly didn't pass around that sort of cash. Maybe he'd just given them some information on where to make a good buy. In any case she was glad he was sober for a little while. She headed home on her bike and just made it inside before the rain started.

The local nightly news was all about the murder of a florist in the west end, probably a botched robbery—grisly details to follow at eleven, the announcer promised.

The British mess had spilled over into Argentina where, it was reported, the queen-regent had gone to have the king's blessing installed. Back home, the Republicans were still in revolt.

France had declared an economic embargo on Germany, ignoring the fact that there were no guards anywhere along their entire porous border. There was no diminution of traffic along the highways.

Beryl's Run

Clear skies and cool temperatures were predicted for Thursday and Friday.

The beeper went off at seven in the morning. It took five slaps of her hand at the side table to find the handset and dial the number that had called. "Yeah?" Beryl mumbled when Weed answered.

"It's Philip!" Weed was damn near crying on the other end. "They found him in a ravine up in the valley. He's dead, Beryl. Philip's dead!"

Beryl came fully awake. "What the hell was he doing out there? Shit, he hardly ever leaves campus."

"I didn't know I would get him in trouble," Weed continued, sobbing uncontrollably. "They said they were going to give him some business."

"Weed, what are you babbling about? Who said what? And what trouble?" The connection between what Weed had said and Philip suddenly clicked. "God," she sat up, fully awake, "could this have anything to do with those guys who shot at me the other night?"

"What do you mean—*shot*?" Weed all but screamed. "You said it was a *backfire*!" It didn't take much to set Weed into panic mode. "Oh God, B; is that what those guys wanted?"

"What guys?" she shot back. "What's up, Weed. Does this have anything to do with all that money of yours?"

"They just wanted to know who got the package you picked up downtown, that's all. I thought they wanted a buy, is all. Jesus, B, I didn't know they would do this!"

God in heaven, what had the poor sniff done? She shouldn't have told him about Philip. If she'd told him what was going on maybe he wouldn't have been so gabby. Then another thought came to mind. "They saw *me* get into the damned truck! Weed, did you tell them about *me*?"

Weed groaned horribly, but didn't answer. There was a click and the line went dead.

Her head was reeling from the news. Jesus, did this have anything to do with those characters that shot at her? For the first time Beryl realized that there were some serious players in the game. Up to now it had been a casual thing, thumbing one's nose at authority, making bio-toys for other kids and making a little (actually, quite a bit) on the side. It had almost been a game. But the shot told her there were other players with higher stakes, bigger sharks who would chew up a small operator like Philip without thinking twice. This wasn't a game any more!

Philip was dead; the cold, hard-edged reality of that fact kept running through her head, accompanied by the thought that this might have something to do with that damned package. What could have been in it to cost Philip his life? Was it the same two guys, Jake and whoever it was? She shivered at the chilling thought that they could be looking for her as well!

Beryl slammed the phone down and was up, dressed, and out the door a few minutes later. What the hell could she do? For lack of any better idea she went across the alley and up to the lab.

The colonies were still growing, the tubes were all in their place. The familiar setting calmed her. Maybe she was just panicking over nothing. Maybe Philip's death had nothing to do with Weed, or with her. Stupid to worry so. Just the same, she was glad that Weed didn't know where she lived.

She went back and punched up Weed's number. It rang three times before the answer box clicked on. Maybe, she thought, he'd run out after the call.

Yes, that would be what he would do after she'd established a connection between the guys he'd spoken with and Philip. Most likely he'd high-tailed it to campus to hide in the crowd. That wasn't a decent long-term strategy, but maybe it would keep him safe until things cleared up.

When she arrived on campus the buzz around the Union was that Philip had sniffed an entire shipment of happy-go. Empty inhalers had been scattered all around him, they said. The evidence, they grinned, was as plain as the stains on his pants and the smile on his face. At least he'd gone out happy, somebody joked.

Only Beryl knew that Philip wouldn't have taken that heavy a load. In all the time she'd known him, he'd never shown any desire to sniff, not once! Damn suspicious, it was. His sudden death sure didn't sound like an overdose of joy to her.

There was a message from Felice waiting when she called in to her service. "This woman, she is very anxious for you to finish quickly," he said when she called him. "She says that she will double the price if you can have it ready before the weekend. She became very upset when I told her we could not deliver earlier," he apologized. "She has threatened to take her business elsewhere."

Beryl considered. Double the fee would give her an extra two thousand to put away. Well, it was worth losing a few hours of sleep to make that sort of money.

"Did you tell her she would lose even more time if she went someplace else?" Beryl argued before she realized she was preaching to the choir. "Felice, you know that it takes time to do this sort of thing. I'm not some fancy lab with a few gigabucks of fancy equipment. The way I work means that it takes longer. Damn it, tell her that it takes TIME, for God's sake. I told her this weekend and that's when I'll deliver. Tell her not to worry."

"I told her all that, but she is *mo*y impatient. Very nervous type. Very much worried, if I read her right. She's got lots more money to throw around."

Beryl considered. Where was the crying little potential divorcee who'd begged her for help? What had changed her since then, she wondered. Had her first inklings of suspicion been right? Was the woman part of some complex government sweep operation?

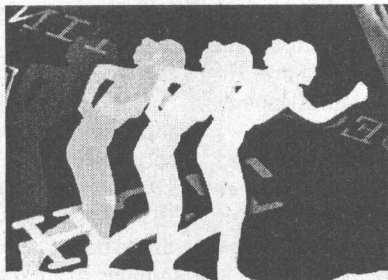
"Yeah, I heard you," Beryl said when she realized she'd left Felice hanging on the line. "Don't you think it strange that she should offer to double the fee if we hurry? Why should a few days matter?"

Felice hesitated before answering. "Si, I agree. This doesn't feel right to me, Chiquita. I don't trust her. I checked as you asked and found that she used a false driver's license. The listings for San Francisco say there is no such address."

"So she's trying to keep her tracks covered. Sounds reasonable to me—we've done that ourselves. But I don't think that's enough to make us to drop this deal," Beryl said.

"Maybe, maybe not." Felice did not sound at all sure of himself. "You think we should cancel and just walk away?"

"No. No, I don't," Beryl protested. The last thing she wanted was to have the woman back out. Not after all she'd gone through. Besides, she needed that money!



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"Maybe I can move up the schedule. I'll try to get the shipment to you by tomorrow. If not then it's Saturday morning at the very latest."

"I will try to calm her down," Felice promised reluctantly.

"Be sure to tell her that I've spliced the samples the way she wanted," Beryl said. "I'll drop it at the usual place so you can deliver it and get our money. After that I don't care who she is or what she does with it."

Felice hesitated a moment, "She wants to know exactly how I'll be picking it up. She's very insistent."

An alarm went off in Beryl's head. "Don't tell her anything, for God's sake. You know how I feel about letting customers get too close to our operation."

"Yeah, I know," Felice said. "Anyway I just told her that I wasn't sure—it changes from job to job, I said. Kept it fuzzy."

Beryl chewed her lip. Why was this woman so curious? The guys with the guns and Philip's death were problems enough. She didn't need another puzzle. Jesu, what had she gotten herself into?

"I'll call you when its ready," she promised.

Weed was sitting at a table in the Union's snack bar, contemplating the coffee dregs in the bottom of a well-chewed Styrofoam cup. He hadn't changed his clothes since yesterday and had a day's growth of stubble on his face. He looked more like himself.

"I'm sorry," he mumbled when she flopped into the chair opposite him. "Just wanted to make a *big* score . . . didn't think I'd get Philip in *trouble*. Jesus, B, I didn't *know* they would *kill* him." He rubbed his nose and wiped his finger on his jeans. That was enough to tell Beryl that he was back on something to help him forget.

"If anybody killed him. I'm still not sure about that," she replied calmly, surprised at herself for going against her own better judgement. "Listen Weed, we don't really know that this had anything to do with what was in that package I picked up. Maybe Philip ripped off one of his suppliers or something."

"Sure, s . . . some of the trade's pretty nasty," Weed said nervously, glancing at the door. He rubbed his nose vigorously and sniffed loudly. "Hammer's a rough character."

There was that name again! "So Hammer is a distributor?" she said casually. Weed nodded and then went back to nervously chewing on the edge of his cup.

Beryl thought furiously; the distributors had a lot invested, a lot at risk. Little guys like Philip wouldn't be worth the time or energy to bother with unless, of course, he did something incredibly stupid. "What could Philip do that might attract Hammer's attention?"

"Maybe, maybe he *stole*, like, *something* he wasn't *supposed* to?" Weed suggested as his eyes darted here and there.

"What did you hear?" Beryl demanded. Weed still had contacts among the distributors. He heard things from time to time.

Weed looked away. "There's some new *stuff* coming down from Ontario," he began. "Top of the line product—Brazilian, I heard."

"How the hell would Philip get something like that?" she demanded. "I didn't think that his connections were *that* good."

Weed waffled for a few minutes, fiddling with the cup and scratching his nose. "His father deals with shippers that handle stuff for the MAFIA. Maybe he, uh, bribed one of the drivers to snitch a little. Just a thought."

Apparently Weed knew more about Philip's dealings than she did, Beryl thought. It was no great surprise to her that Philip's father was running illegal shipments. She didn't doubt that he knew that his

son was dealing. Probably tolerated it as good training for the day Philip took over the firm.

"So the guys who took a shot at me were either MAFIA or working with his dad?" she said angrily. "Nice family and friends."

"Don't worry B. Not your *problem*," Weed said after making another attempt to drain something from the cup.

"What do you mean?" she said with some heat. "Don't you understand that I'm scared as hell about this? Weed, what can I do? I can't go to the cops or the g-men for protection. I'd go to prison for sure."

"Not *prison*. You'd need a *protection* program," Weed said slowly. "Hammer's got friends everywhere, especially in prison. He doesn't give up easy."

"The squealer program, you mean," she said with disgust. "I'd have to tell the g-men about my suppliers and distributors to get that sort of deal."

"You wouldn't tell them about *me*, would you?" Weed looked up, alarm written clearly on his face. "B, I didn't tell them about you, you've got to believe that."

Beryl nodded as if she agreed, but doubted him. Weed was clearly scared out of his pants. There was no telling what he'd blurted out when they tempted him with that wad of cash.

"Maybe Philip's *dad*," he suggested. "Maybe he *could* have them call off those guys."

"Philip told me that his dad's traveling in Asia," Beryl said miserably. "Besides, I wouldn't know how to reach him."

"Hey, maybe I can find Hammer's guys," Weed said quickly. "Tell them I didn't know what I was saying. Not that I said anything about *you*, really!" he added unnecessarily.

Beryl patted his arm. Weed was such a poor liar. "Don't worry about it, Weed, I know you didn't know what was going to happen. I don't blame you." Not much, she silently added to herself and took a deep drink of her cooling hazelnut-flavored coffee.

Weed suddenly jumped up and ran to the phone bank next to the coffee bar, where he furiously punched at the buttons. After a few minutes of intense conversation he returned to the table and sat down. There was a smile on his face. "Going to meet somebody at the bus stop in half an hour to take me someplace safe. You can come along, if you want. It's way out of town."

Beryl raised an eyebrow. "You kidding me? Weed, I can't afford to miss finals this close to graduation. No, I won't go with you, but, hey, thanks anyway."

They talked about nothing much until it was time for Weed to meet his ride. They split at the entrance, Beryl heading for her morning chem lab and Weed shambling toward the bus stop just outside the campus gates, wiping his nose every fifth step of the way. She decided she'd hang out in the lab for the rest of the afternoon. Nice and safe there, what with the campus cops watching to make sure she didn't steal something.

By that evening the fuzzy growth of the colonies had progressed nicely. Beryl carefully segregated them into groups, after first removing a small sample and placing it in a sterile tube. When she was done she had eighteen tubes, each marked with a letter showing which agar dish had spawned it and a number designating the colony on that dish.

Into each tube she inserted a tiny drop of alcohol to kill the bacteria. Next, she heated them to break down the cell walls and free the DNA. As the hot plate was doing its work she sorted through the drawers until she found a pack of sublimation test papers. She

Beryl's Run

marked twenty sheets and then methodically rolled each into a small cylinder and stuck it into the tubes as she withdrew them. She made certain that the edge was just below the top level of the liquid.

While she was waiting for the liquid to migrate up the papers and tell her the gross results, she called the number Weed had left. She was worried about the poor guy. Despite what he had done, she'd known him for too many years to let one stupid slip affect her feelings.

Somebody answered on the third ring and sounded pissed when she asked to speak to Weed. "Waited an hour for the god-damned kid to show at the bus stop," the man complained. "I wasted an hour driving around, looking for him. Do you know where the hell he's gotten to?"

Beryl thought fast. "He was walking to the bus stop when I left him this afternoon. It shouldn't have taken him more than five minutes to walk there."

"Well, he sure wasn't there when I arrived. Be just like him to go someplace else. Well, tell that asshole I'd like an apology whenever you see him. OK?" There was a click as the line abruptly disconnected.

Beryl wondered if she should tell the local police, but decided against it. They'd want her to come down to discuss possibilities with them and who knew where that would lead? Where could Weed have gone?

By the time she got back to the workbench the papers were saturated. She removed each one and rolled them flat onto a sheet of glass so that they formed five rows of four square papers. Then she put them under the lamps to dry.

What if the guys with the guns had caught up with Weed and taken him somewhere, she worried. If they had killed Philip, then what chance did Weed have of getting out of this alive?

Practically none, she concluded sadly. And that left her as the only witness who could identify them. Thank God that Weed hadn't known where she lived. Then she paused; Weed did know she was a student and could easily have told them about her hangouts. Those thoughts stopped her for a moment. Perhaps she should call the police after all.

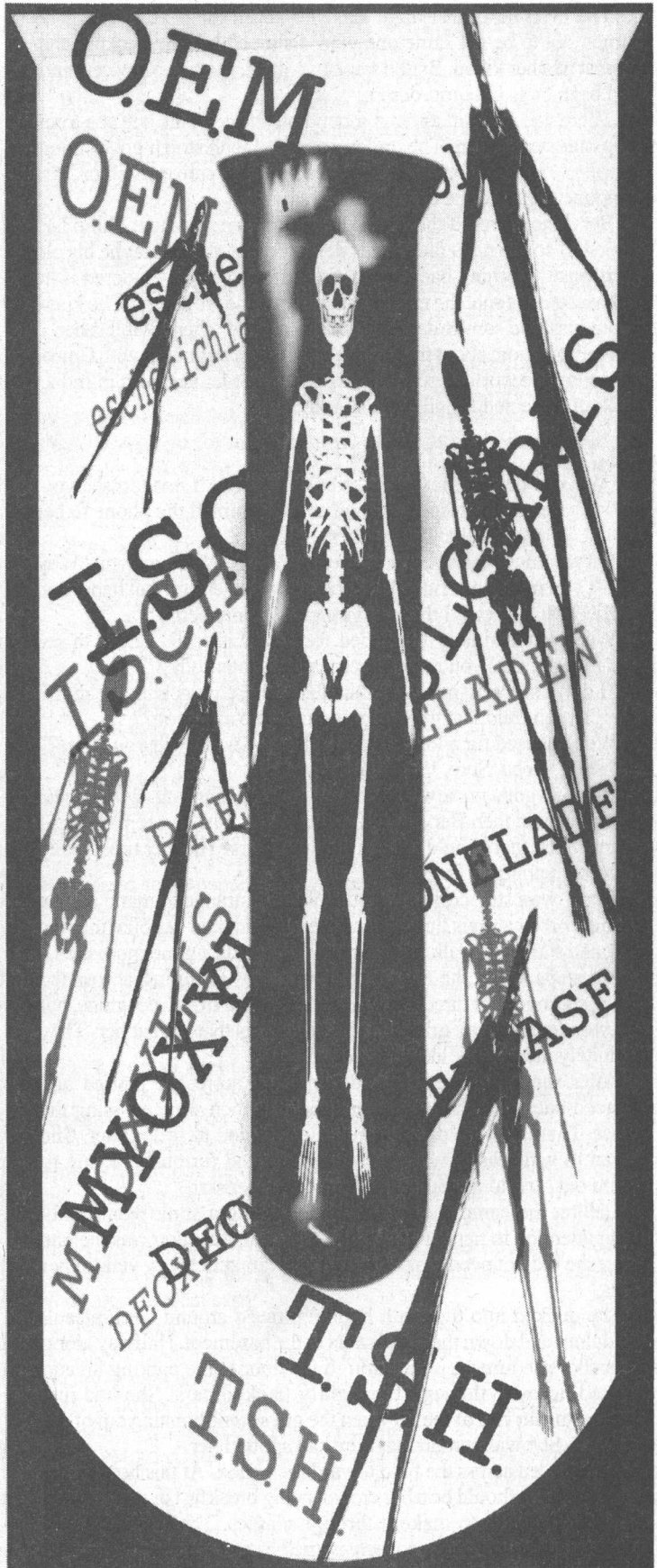
Dumb! They would bring in the g-men if she let slip what Philip had been involved with, which would naturally lead to her business, and she'd end up in a nice, cozy prison cell.

What a choice; being killed by some unknown hoods or locked up forever. Say, maybe she could learn some useful trade in prison; building chairs, or refinishing desks. Yeah, that would be a nice profession after her brilliant bio-engineering career aspirations went down the toilet.

But the alternative might be death with a big Dee—the big career stopper! What to do? Neither prison nor death was an attractive option, and she was only days away from graduation and, if the woman came through with the money, her dash to Cuba.

The timer chimed to remind her to check the papers. She could barely make out the traces on them, they were so faint. But, when she sprayed them with dye, their unique signatures popped out, each one a conversation that told her volumes about the genetic characteristics of the colony it represented. Sample Y-3 looked to be the most promising, with L-1 and L-3 very close seconds. They all were closely matched to the codon she wanted to modify and had the key mark that identified them as susceptible to the tailored transport virus.

It was only a few hours work to complete the job and prepare the package for Felice.



Absolute Magnitude

The local news that night was still about the dead florist, who turned out to be the same one who'd slipped her the package that almost had her killed. By the same two guys, she bet. They certainly had been busy little murderers.

There was a report about a second bio-bust—This one at a truck stop outside of town. The trailer was filled with stolen government supplies. "Headed for resale to the criminal and subversive labs," the announcer quoted the chief agent as saying.

Beryl wondered if that could have been the shipment Philip had raided. If so, then his father was definitely involved. Maybe his old man wasn't coming back from Asia after all. She wondered if he knew about his son, the raid, and the theft? She wondered if he knew about his *dead* son. But mostly she wondered where that left her.

Nothing more about the Brits or the French argument with China. This time the world news item was some border skirmish in India. Rain projected for all day Saturday.

Weed beeped her an hour before dawn. "I need to see you, Beryl," he rasped as soon as she fumbled the phone to her ear and dialed the number.

Beryl came to instant wakefulness. "Weed? Where are you? Why didn't you meet your ride? Everybody's wondering what happened to you. Jesus, Weed, I thought you were kidnapped!"

Weed laughed, but it sounded forced. "Listen B, I need to see you—soon. Can you meet me on campus later today?"

"I don't see why not, but what about those guys with the guns? Aren't you afraid that they're going to come after you?"

Weed paused for a long while. "Uh, no. Listen, will you come?" "Sure, Weed. Sure, I'll be there."

"Great. I gotta go now. Hey, it was nice meeting you. Bye." There was click, and then Beryl heard the dial tone. She swore; What had he meant by that? She'd known him for years. The guy must really be on something to forget that.

Beryl was still curious about Weed's strange remark as she pedaled onto campus three hours later. She locked her bike into the rack and started to walk to the library. She hadn't gone more than a dozen steps when she noticed the two guys lounging across the street, staring in her direction. They were too far off to recognize, but she wondered if they might be the same ones that shot at her. They definitely didn't look like college types.

After she had gone a few dozen steps more she paused and glanced back over her shoulder. The two men were crossing the street. There was no doubt that they intended to follow her. She began to walk faster while her mind worked furiously, trying to figure out how to get rid of them and save her skin.

Calling the campus cops was out. Raising a stink would only bring attention to herself and, at the moment, attention was the one thing she did not need, not with the implicating delivery vials in her pack.

She ducked into the math building, raced around the Foucault pendulum and down the spiral stairs to the basement. Halfway along a corridor she turned, went through the door to the parking lot and twisted her way through the tightly packed cars. She had just reached the far end of the lot when the guys came bursting out of the building. She was certain that they had spotted her.

Beryl raced across the field toward the Union. At this hour of the morning there should be a big crowd eating breakfast or just sucking up enough coffee to make it through classes. They wouldn't try anything there, not with so many witnesses around.

But that would only be a temporary remedy. She'd have to leave to make the drop to Felice at the library at nine. If the two were smart enough to find out where she usually parked her bike, they were smart enough to bide their time. Damn, what could she do?

At the last minute she turned and, instead of entering the Union, she went into the student store. Unless her pursuers were awfully familiar with the campus, which she doubted, they had no way of knowing there was a second exit. As she walked the aisles she saw one of them loitering outside, watching her through the glass, waiting for her to come out. Where was the other one? Had they guessed her plan?

There was no turning back now. She opened the back door and glanced around. Only a few students were in sight. With a sigh of relief she headed toward the library. She still had twenty minutes to drop off the goods for Felice and then she could scream bloody murder to the cops if those two came anywhere near her.

She was waiting to cross the road in front of the library when a car stopped abruptly in front of her. The back door flew open and she glimpsed Felice sitting inside, up front, next to the driver.

"Quickly, get inside!" a woman's voice ordered from the back seat. She had a bit of an accent, just like the woman on the telephone.

"Hey!" someone shouted. Beryl looked behind her. One of the two men was running full tilt toward her, reaching for something inside his jacket. That glance was all it took to decide. She didn't know if he was reaching for a gun or not, but she sure as hell wasn't going to wait around to find out. She jumped into the back seat and slammed the door shut as the car accelerated.

Beryl put the pack between her legs as the car swerved, without slowing, to avoid some students crossing the road against traffic.

"Do you have what I requested?" the woman said calmly.

Beryl was confused. "Why aren't you using the usual pick-up routine?" she addressed Felice angrily. "Yeah, and why the hell did you bring her with you? Don't you realize how this screws up the entire process. Shit, now we'll have to set up a whole new distribution system!"

"I can assure you that your friend had no choice in the matter," the woman said smoothly from the other side of the car. "Nor do you."

Beryl's eyes widened as she saw the tiny gun in the woman's hand. It was pointed directly at her heart. Apparently this was her day to attract antagonistic armament.

"Does this mean that we won't get our money?" she asked.

"Oh, you will be paid, providing that you have what you promised," the woman replied. "Mr. Fleming, there, assured me that you would have it with you this morning." Felice kept his eyes straight ahead. He said nothing.

"Would you tell me what is going on?" Beryl said. "Who are those guys back there, and why does everyone want to point guns at me, and, oh yeah, how did poor Philip figure in all of this?"

The woman gave the driver some instructions in a foreign language. Beryl knew a little Spanish, but it didn't recognize any of the words. Maybe it was Portuguese.

"I do not know about this Philip person," the woman replied. "Nor do I know of any men chasing you. Perhaps they are government agents or police who have become aware of your trade. I am certain they are not after us. We have covered our tracks very well.

"Then who the hell are they?" Beryl said incredulously, with a glance through the rear window toward the disappearing campus. "More important, who the devil are you?"

Beryl's Run

The woman motioned with the pistol. "It would be better were you not to know, my dear. You have been the pawn in a very large game, one that you could not possibly understand. Pull over here!" she ordered the driver abruptly after they had driven in silence for ten minutes or more. West of the campus were the fields of the agricultural school. The car swung to the side and stopped right on the road that bisected the fields. Beryl thought about jumping out and running, but one glance outside showed the futility of that. For a half mile in each direction was bare, plowed ground, waiting for the winter wheat. She'd make an easy target.

"Now," the woman went on, her gun still pointing at Beryl's chest, "please to give me the sequences you have modified."

Beryl reached into her pack, withdrew the tightly wrapped package, and lay it on the seat between them. "The documentation is inside, along with the transformed DNA. I put the match papers in there, just in case you wanted confirmation. I used those cryo-packs you gave me so they'll stay in good shape for a day or two."

"I have been assured of your thoroughness," the woman said. "Quality is one of the reasons why we selected you."

With those words she picked up the package and placed it carefully in her purse. She pulled out a thick envelope and handed it across. "This is the amount I promised. Now, quickly, we have no more time for pleasantries. Get out!" The woman made shooing motions with the barrel of the pistol. "Please excuse us. We have a plane to catch."

Beryl stepped out of the car and watched it throw gravel as it sped away. "Pleasant people," she observed with a shrug. "What shall we do now, Felice?"

Felice looked scared. "I . . . I think that we should do as they say, Chiquita, and forget about them as quickly as we can. I do not want to have British intelligence angry at me."

"British?" Suddenly all the pieces fell into place; the queen-regent's impregnation, the seclusion, the woman's accent. "Jesu, was that really the queen?" she said, and instantly corrected herself. More likely it was one of her handmaidens. The queen herself wouldn't stoop to such a mundane errand.

"Not even close," Felice laughed. "They spoke freely around me, not knowing that I understood Portuguese. I think that they're with the British Republicans."

"But why the hell would the Republicans . . ." She stopped. "The king didn't have a nervous disease, did he?" she asked rhetorically as Felice shook his head grimly. "Oh, shit!"

"I believe it is time that we ended our little business relationship," Felice announced as he stared down the road. "It is a good time to go our separate ways, no? You are graduating and heading elsewhere, while I," he paused as if considering whether to tell her his destination or not. "Perhaps it would be better if you did not know," he said with an embarrassed grin.

They walked in different directions; she toward campus and he toward town. There were no tearful good-byes—it had just been a business relationship.

Beryl kept her head down, studied hard, and blew off the finals. She also made a discreet phone call to a number she'd gotten from Philip a few years earlier. It was written on a scrap of paper torn from one of her notebooks.

"Yeah?" the coarse voice demanded when the phone stopped ringing.

"Listen; I need some paper done," Beryl said simply. "Tell me what do you need from me."

"Depends on what you can afford. Cost of paper's gone up a lot in the last year," the voice grumbled. "Insurance went up as well. Man's gotta watch out for his health, y'know."

Beryl wondered if this was just a ploy to charge more than the market price or if the cost of counterfeits really had increased. Crap, she hoped she had enough money to pay for it. Her savings had been based on having enough left to live on for a while after she made it to Cuba. Even with her skills and knowledge a job would take some time to find her. "Can't pay the sky," she replied. "But I'm willing to pay well if the quality of the paper is acceptable."

"No problem there," voice answered defensively, she thought. "Twelfth and Ess, 2300 hours. We can talk price then." There was a click and the line went dead.

Beryl biked to the bus line, took the 35T to Tenth and walked two blocks to "S" street intersection. This was the commercial district and largely vacant this time of night. She stayed to the shadows and kept a wary eye for anyone suspicious looking. What would her contact look like? She half expected someone in a trenchcoat and hat to come strolling out of the fog, except there was no fog. No trenchcoat, hat, or anyone else, either.

Beryl looked in all four directions, wondering what was supposed to happen now in this empty intersection. It was almost time for their meeting. Where the devil was her contact?

A car drove slowly by, passed her, and then backed up to stop in front of her. One window rolled down. "Get in," barked a voice from the shadowy figure inside.

"Are you the paper man?" Beryl asked nervously.

"What the fuck do you think, stupid? There ain't nobody 'round here but us two. Who the hell do you think I am?"

Beryl got in the car, which immediately drove off, heading slowly down Twelfth. She glanced at the man behind the wheel. He had his collar pulled up so that she didn't get a clear glance at his face.

"I need to get to Cuba," she said softly. There was no reply. "I said I need some papers so I can get to Cuba," she repeated.

"Heard you the first time," he said angrily. "Figure you need a passport, tickets, set of personal ID, valid credit cards—the works." He fell silent as he maneuvered the car around a corner and accelerated down the block. "Didn't see your car. Where did you park?"

"I took the bus. Listen, what has that got to do with anything? What's it going to cost me?"

"The bus, huh? Might have figured. You got twenty grand for starters? More if you want a different ID than your own."

Beryl whistled. That would put a great big hole in her bank account, and from the way he said it there was probably more to pay later on. "I can pay. What's the total cost for a different ID?"

The man chuckled. "Have to get into the records databank for that, which means I'll have to bring on a subcontractor. Then we need some good pictures, fingerprints, and retinal scans. Oh, hand over your medical card!"

"My medical records! Why do you need them, for heavens sake?"

"You'll need a new smart card, honey. Did you think you could get away with carrying a different ID and carrying your own med card?" The border guards aren't fools. I hear they even check the IDs occasionally," he snarled sarcastically.

Beryl figured she'd have to pay a premium for her stupid remark. Served her right. "Where do we go to get the pictures taken?" she asked.

"We don't go anywhere. I'll make an appointment for you and he'll call." He gave her an address. "Pay the photographer's bill," he ordered with a smile. "I figure it'll be about twenty-five euro."

Absolute Magnitude

Beryl cleaned up all traces of her operation. She flushed the viruses, smashed all her glassware and scattered the pieces among the recycle bins in the alley. The oven and hot plate went into the recycle, along with most of the paper goods. She took Weed's old Packard centrifuge and threw it down the sewer. The microprobe was too recognizable to put in the trash, too dangerous to keep, and a problem to sell on short notice. She buried it beneath Mrs. William's roses, under three layers of horse crap. Who knew, some day she might come back for it.

It wasn't hard to figure out why the Republicans had used an underground splicer. Too many people worked in the large MAFIA labs and people talked. By using an independent they could get the job done without attracting attention.

Then again, maybe she hadn't been the only one, she mused. Maybe they used a lot of splicers working in parallel in the hopes that one would escape notice. Maybe they had more than one way to destroy the monarchy.

The woman's splice job was certainly more than it appeared. Beryl had taken it for granted that the splice was to correct Heinteller's, not to implant it. Would the transformed DNA get to its intended destination or would the Republicans fail? Maybe she'd know in nine months or so, when the British king was born.

Then she waited for the call confirming her photo appointment.

The photographer's studio was downtown, not far from where she had been picked up the night before. A bright young man greeted her, checked the appointment book, signed her in, and escorted her to a seat before a standard camera. Four flashes later he handed her a bill for twenty-five eurodollars and processed her cash card. Her debit line, however, read twenty-five *thousand* shorter when she checked. It was a slick way to launder money.

When she went back to pick up her photos she found the package contained a well-used driver's license, a used medical card with a bent corner, three credit and one debit card, all so used that the numbers were stripped of their coloring. The debit card contained five thousand dollars, which surprised her, until she discovered that they had dipped her account for the extra money, and taken a few hundred as handler's fee. The passport picture didn't look at all like her. Well, it looked like she would have if she gained about forty pounds. Apparently this Bonita Juarez had gone on a crash diet. Nice of them to keep her same initials—not that she had any monogrammed luggage.

She ordered round-trip tickets to Antigua for her new persona using the false credit cards, which were apparently unlimited—a very nice touch, she thought. But she ordered tourist class just the same. No sense drawing attention to herself with an expensive first class ticket.

Her routing was through Atlanta to Miami, then a three-hour layover in Cuba. The stamps in her passport allowed her passage without restriction. But she wouldn't be getting back on the plane in Cuba. Nor would she be using the return ticket.

The local news that evening was uninteresting—some scandal in the city government involving a lot of money, drugs, and women—nothing out of the ordinary. World news was only slightly more interesting with the China situation getting uglier by the day now that Spain had thrown in with the French. The Italians were staying out of it for the time being.

There was no news about the Queen of England.

Beryl—No; Bonita, she reminded herself—had to make a run to the grocery store the next day to get some aspirin and pads. She hated being out in the daylight, but there was no reason to expect

Hammer's men to be hanging around this neighborhood. The last time she had been on campus she had spotted some toughs who looked out of place, but that could just have been her overactive imagination.

Once, she had seen one of the two who had shot at her. But he was looking the other way and she was able to duck back before being spotted. She hadn't been on campus since then. Neither had she seen nor heard anything more from Weed.

She had her bags packed and ready to go. The one she would check was crammed with underwear, dresses, slacks, and toilet articles, just like any other tourist's suitcase. Since it would stay on the plane she didn't put anything of real value inside—just stuff she could lose without suffering pangs.

Her carry-on bag contained the essentials, including two changes of clothing—she could buy the rest when she needed to. The sack also contained her complete set of library disks, a journal, and her palm-top computer. They were the typical paraphernalia any student would carry. Nothing likely to raise an eyebrow, unless they decided to examine the disks and found the proscribed genetic texts she'd built over the years. The Cuban pharms probably had better libraries, but she was familiar with all of the quirks and foibles in this one.

Besides, it had sentimental value.

"Are you ready to go?" Ms. Williams asked. She was dressed in a tight-fitting lime green dress that emphasized her figure. "I guess your parents are anxious to see you."

"Sure are," Beryl said cheerily. Her parents hadn't been a factor in her life for years, but there was no reason for Mrs. W to know that. She thought Beryl was just going home, just like the other hundreds of graduates.

"Do you mind stopping off on campus?" Beryl asked. "I asked Weed to pick up my diploma for me. I was afraid that it might get lost in the mail." Mrs. Williams agreed.

Beryl knew it was just her ego that drove the desire for the diploma, the physical proof that she had achieved a modicum of academic expertise. After putting herself through five and a half years of hell she deserved some proof that she hadn't wasted her life. Counting coup, scoring a tag, pissing on a tree—it was all the same—she wanted that damned piece of paper!

The area around the dean's office was a madhouse, with everyone racing in and out, preparing for the summer break.

Weed was standing out front when they arrived at the building. He waved and smiled when he spotted them and motioned them into an open parking space.

"B. . . Beryl!" he yelled. "How are you doing? What's this about you going on a trip!"

"Just heading home, Weed. Nice knowing you, you little turd! Why did you set me up last week? I thought you were my fucking friend."

Weed glanced worriedly around. "I had to! They were going to hurt me, B. Like they did Philip. They had knives, and guns. I. . . I thought you got my signal!"

Shit! So *that* was what his dumb remark meant. For a second Beryl was ashamed that she'd doubted him—but then she thought of Philip. Even if Weed's fingering him had been an honest mistake it was still wrong. In a small way Weed was still responsible for Philip's death. She figured where the balance lay and started to voice an apology.

"Beryl, I need you to see something," Weed blurted. "It's *real* important."

Beryl's Run

Beryl shook her head, "Just give me my diploma, Weed. Look, I'm sorry, but I've got a plane to catch and . . ."

Mrs. Williams interrupted them. "Are those friends of yours, too? They seem to be in an awful hurry to get here."

Beryl glanced through the rear window and saw a pair of tough-looking men walking toward them. Both were staring intensely in her direction. She wasted neither time nor motion as she opened the back door and yanked Weed into the car. "Get the hell out of here! They're going to kill us!"

Helen Williams didn't hesitate. She reacted as if she had been training for this moment her entire life. In one smooth motion she released the brake, twisted the wheel, and gunned the engine. The tires screamed against the pavement as the car flew into an opening in traffic barely large enough to hold them. Behind them Beryl could hear the sound of blaring horns and crumpling fenders. But those faded as Mrs. Williams tore around a corner and accelerated toward town.

"They followed you, didn't they!" Beryl screamed at Weed. "God damn it, Weed. You are a fucking albatross! You set me up again!"

"I—I don't know them," Weed protested. He was on the verge of tears. "I really don't know them!"

"I think that car is following us," Mrs. Williams announced. "Oh, this is so exciting!" She cut sharply to the right, throwing Beryl and Weed against the opposite door, and turned the car down a side street.

Beryl looked back and saw a green sedan make the same awkward turn, nearly clipping a late-model car parked on the opposite side before regaining control. Mrs. Williams turned to the left then made a sharp right into an alley. The green car roared past the alley entrance a few seconds later. "Good going," she remarked and wondered what else about Mrs. Williams she might not know.

But when they emerged from the alley the green car was coming from the opposite direction. They backed into the alley and out the opposite end.

"T—turn right!" Weed exclaimed suddenly. "Take the next right and then go left!" He sounded as if he knew where they needed to go. Mrs. Williams did as he said while maintaining the same breakneck speed. They found themselves in a dead-end.

"We can *hide* there," Weed said in a breathless rush as he opened the door and pulled Beryl out of the car. "C. . . Come with me!"

Beryl thought that she heard the approach of a car. "Where?" she asked in panic.

Weed pulled Beryl into a narrow passage between two buildings. The passage led to a small arcade littered with illegal cigarette butts and discarded inhalers. There was a steel door in one wall.

Weed rummaged in a small potted plant for a minute and produced a rusty key. He inserted it into the door's lock, twisted, and pulled the door open. "Come on!" he ordered, motioning Beryl inside. He shut the door behind them.

"This is where I did some deals," he explained as they hastened down a narrow corridor between tightly packed crates. "Philip *told* me *where* to put the key." He twisted and turned, leading her further and further into the depths of the warehouse, which she suddenly realized what this was.

Why would Philip have the key to a warehouse, she wondered as they continued to weave among the boxes? "Mrs. Williams!" she exclaimed suddenly. "Shit, we left her behind. Come on Weed, we have to get her."

"Can't do that—they might be out there. C'mon B, we can hide there," Weed said suddenly as he pointed at a dark office.

"I can't hide here," Beryl protested. "I've got a plane to catch in less than two hours. Weed, I need to get back to Mrs. Williams. I've got to get to the airport!"

"B. . . but those guys are after you, B. You can't go back out there. Come on, I think I left some sniff in there. We can have some fun while we wait for them to go away."

"I don't want any sniff. I just want to get to my flight," and freedom, and away from all this trouble, she added to herself. Far off, on a distant wall she saw the ruddy glow of an exit sign. She headed in that direction.

"Wait," Weed pleaded. "We *need* to wait *here*." He sounded so desperate that . . . Then it hit her: She was being set up! And by Weed! That was why he brought them here. Somewhere in the distance she heard the muffled thud of a door slamming shut.

"Crap!" She started running toward the glow of the exit sign as fast as she could. Maybe she could make it back to the car, or find some help, before they caught her.

"Over *here!* She's over *here!*" Weed shouted to whoever was coming after her. Beryl increased her pace. She was halfway there.

Suddenly a large figure appeared out of the shadows directly in front of her. She didn't hesitate for a second. She ducked, leaned forward, and drove her head into the man's middle. He fell backwards with a whoosh of expelled breath and toppled to the floor as Beryl staggered, seeing catherine wheels before her eyes from the blow. Her neck hurt.

Beryl regained her footing and started to take a step when a hand clutched her ankle. She turned and kicked wildly, trying to free her foot, and connected with something hard, like a rock. Whoever held her ankle released it immediately.

Beryl started to run but pain shot up her leg. Must have hurt myself, she thought. Must have broken some toes or something, when she kicked the guy's head. She hobbled away as fast as she

could move.

The exit light was closer, but not close enough. She ducked into the shadows and crept toward the exit. Pain shot up her leg with every step.

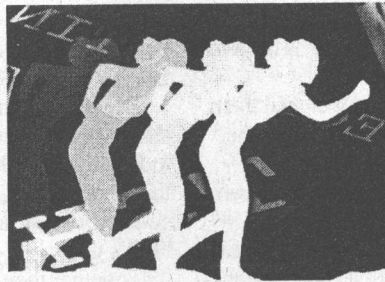
She heard something to her right. Was it the skittering of a mouse or the footfall of one of the men? She had no way of knowing. She held her breath, waiting for some sign. There it was again, closer this time.

"You see her, Jake?" someone shouted from far behind her, back toward where she had left Weed.

There was a scuffle and then the clatter of a box falling to the floor. A stream of curses followed. Apparently Jake wasn't nearly as graceful at navigating in the warehouse's shadows as the mice.

Beryl crept quietly away, crossing another aisle as she made her way toward the door. It was only another twenty or thirty feet to go. But could she dash across that last ten feet of clear space without them spotting her? It really made no difference; they would know where she was the instant she opened the door. She moved forward a few more steps.

"Beryl?" Weed cried. She could hear his footsteps coming up the main aisle toward the door. Damn, of course he had seen where she was heading. Had he told the others? Was one of them waiting for her to make the attempt at the exit? "Beryl!" he called again. She held her breath, not daring to make the slightest sound that would



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betray her location. She could hear him drawing closer and closer. Was there a second set of footsteps with his? She couldn't tell.

The door flew open suddenly and the light from outside momentarily blinded her. When she recovered her vision she saw Mrs. Williams standing in the doorway. "Beryl? Are you in here?" she called out.

Someone started running toward them, the footsteps rapid and heavy. Beryl panicked. What should she do? Mrs. Williams shouldn't be involved in this—she'd done nothing more than offer Beryl a ride. "Get outside!" Beryl shouted. "Run away, Mrs. Williams—run!"

The running footsteps hesitated and then sounded as if they were coming in her direction. Beryl threw caution aside and hobbled as fast as she could toward the door where Mrs. Williams still stood, mouth agape. Her foot hurt like hell every time her weight came down on it. Four more steps and . . .

"Got her!" a husky voice shouted inches from her ear as a hard hand grabbed her arm and twisted it viscosly. "You little," he began as Beryl lashed out and brought her knee up into this groin. The man let out a shriek as he doubled over, dragging Beryl to the ground. After recovering he kicked her hard in the side, sending stabbing pain through her body.

"Easy, Jake," another man said as he dragged Mrs. Williams to where they were struggling. "Don't damage the goods too soon." He twisted Mrs. Williams around and ran his eyes up and down her trim body. "Hey, looks like we might have a little fun before we finish the job." He gave Mrs. Williams a quick hug and fondled her breast. "A hell of a lot of fun, it looks like." Mrs. Williams tried to pull away but he slapped her hard.

Weed stood nervously by, twisting his hands as he watched them savage the two women. "You said you wouldn't hurt her, Charlie," he blurted. "You said you just wanted to t . . . talk."

"Get lost, sniffer!" Charlie said. "We can take care of things from here."

"B—but—" Weed began and stopped when the larger man pulled an automatic from his jacket. "Hate to use this, Sniffer. You've done good work for us. Might even give you a bonus, maybe a metric box of the good stuff. Yeah, enough to keep you happy the rest of your life. Like that, would you?"

Weed smiled. "Don't believe him," Beryl said evenly. "They'll do you the same way they did Philip."

"Shut the fuck up!" her captor said as he backhanded her. "Get the hell out of here, Weed. We don't need you any more."

Weed began to shuffle away, stopped and then walked back to the man holding Mrs. Williams. When he pulled his hand out of his pocket there was an inhaler in it. He extended it to the man's face. "Hey Charlie, want a sniff?" he offered as he extended it toward Mrs. Williams' captor's face. He gave the bottle a sharp squeeze.

A cloud of doctored sniff sprayed into the man's face. As he let go of Mrs. Williams and reached up to wipe his eyes, Weed grabbed for the hand with the gun, twisting it between them as he tried to pry it away.

There was a sharp, muffled thud, as if someone had punctured a tire, and Weed staggered backwards, holding the gun's barrel, the grip facing away from him. There was a bemused look on his face as he fell to the floor, the gun clattering beneath him.

"Crap!" Charlie said and looked around for Mrs. Williams, who had taken the opportunity to sprint for the door as fast as her spike heels would allow her.

Meanwhile Jake had dragged Beryl to the fallen Weed and lifted his head. "He's dead," he said matter-of-factly. "Damn fool killed himself!"

Beryl saw her chance and pushed hard as the man leaned over Weed's body, sending him sprawling forward. She rolled in the opposite direction and pulled free as he struggled to rise. Beryl regained her feet and ducked into the shadows between rows of crates, dodging back and forth to lose herself and throw off any pursuit.

While Jake and Charlie were arguing over which of the two escapees was the most important, Beryl worked herself further away from the ghastly scene. She wondered if Mrs. Williams had managed to find a hiding place as well. How the devil were they going to find each other without the two thugs finding them first? She listened, trying to figure out what they were doing now that they stopped yelling at each other.

Jake, the heavy footed one, was walking the periphery of the crates, probably peering into each aisle to see if he could spot one or both of them. She couldn't hear the other one. Was Jake just acting as a stalking horse?

There was a slight sound to her left, away from the fading sounds of Jake's footsteps. Beryl froze. The sound came again, a soft sliding noise that came closer and closer. Beryl shrank back against her crate, trying to make herself part of the shadow, undetectable.

Mrs. Williams came around a corner, holding her shoes in her hands and sliding her hose-clad feet along the floor. "Shhh," she whispered when she spotted Beryl.

"I got this," she said quickly and shoved Charlie's gun into Beryl's hand. "Do you know how to use it?"

Beryl felt a momentary revulsion at touching the weapon, still sticky with Weed's blood. But common sense prevailed and she took it by the grip, thumbed the safety off and lay her finger along the guard. "Sure," she replied confidently, hoping her one semester course in small arms qualified her to actually use the damn thing. "Let's go."

Together they began to work their way toward the door, pausing every other step to listen for any sounds that would betray their pursuers. Beryl only knew of two doors, the one she and Weed had come through and the exit where Mrs. Williams had entered. There were probably others, but the first one was the least likely to be guarded, she thought, and hoped they were heading in the right direction.

There was a clamor ahead. It sounded as if someone were smashing at the steel doors. The sound grew in intensity and, with a horrendous tearing sound followed by a clanging thud, the door was broken open. Shouts of many men echoed through the warehouse. "We are Federal Officers!" a bullhorn announced. "Please present yourselves with your hands in plain sight. Under code G413. . . holy shit, is that a body?" The bullhorn cut off abruptly. Apparently the g-men had discovered Weed's corpse.

And she was holding the gun that killed him. She dropped it at once. As it clattered to the floor Jake rounded the corner, scooped it up and pointed it at them. "Nice to see that we have a ticket out of here," he smiled. "Get moving." He wagged the gun toward the sound of the bullhorn. "We're coming out!" he shouted.

Beryl held her hands high as she emerged from the aisle. A ring of six officers wearing riot helmets, each with a huge fluorescent "G" imprinted on the back of their combat jackets, stood around Weed's body. They were armed with nasty looking weapons, all of which swivelled to point at the three of them.

Beryl's Run

"Put the guns down or I'll shoot one of the bitches!" Jake growled. The men hesitated for a moment and, after a nod from the man with the bullhorn, slowly lowered their guns, put them on the floor, and stepped back.

"You won't get far," bullhorn said. "There's more of us outside. Besides, you've already been scanned for a record search," he said as he pointed to the tiny tube of the video camera on his helmet. "Jake Desousza," he added with a smile as he heard the match from central records come over his radio link. "What are you doing in the Jacobs' warehouse? I didn't know Hammer was involved with him."

Beryl felt a start of surprise. She should have guessed that this was Philip's dad's warehouse. That was how Weed had the key, how he knew where to go, how he knew where to tell Jake and Charlie to wait for them. Shit! How could she have been so stupid!

"You're the guys who were following us!" she said suddenly. But why? Was this because of Philip and her tenuous connection with him? Was it because of that package that got Philip killed? Or had they decided to move against the underground labs just as she shut down her operation? Or did it have something to do with that woman with the Portuguese accent? A chill ran down her spine as she remembered the counterfeit papers in her pocket.

Jake licked his thick lips. "I didn't kill him," he said with a nod at Weed. "It was an accident, honest."

"That's a damned lie!" Mrs. Williams screamed. "He would have shot us too if you hadn't burst in here!"

Jake swung at her, making her dodge to one side. Beryl saw her chance and jumped in the opposite direction, rolling on the floor. Something coughed loudly and Jake, with a surprised expression on his face, fell backwards. A bright red stain appeared on the front of his shirt.

"Get those women out of here!" bullhorn yelled as his troops picked up their weapons and fanned out. One of the officers, a woman by the sound of her voice, grabbed both of them by the elbows and hustled them out the door and up the alley to a waiting black van. "We'll need your statements later!" she said as she turned away.

Beryl looked around. There was no one in sight. Just down the street was their abandoned car. "What do you think?" she said as nodded toward the car.

Mrs. Williams smiled. "I *could* say that I asked you not to go," she said quietly. "But I know that you don't want to miss your flight. Why don't you give me your parents' number and I'll tell them to call you when you get there."

Beryl smiled and rolled off a string of nonsense numbers that Mrs. Williams carefully transcribed onto a scrap of paper. With luck, she would be out of the car and into the airport before the squad emerged from their search for Charlie and called the airport police. Better yet, maybe she'd abandon the car as soon as she saw a taxi and let them figure it out from there. She gave Mrs. Williams a quick hug and ran to the waiting car.

Cuba, freedom, and her future were calling.

Beryl relaxed as the azure coast of Florida disappeared into the fluffy clouds beneath the jet's wings. The transfers in Raleigh and Miami had been hectic. She'd had to dash from gate to gate, narrowly making each connection, and then fuming impatiently as her plane awaited what seemed an eternity for takeoff clearance. In every terminal she'd felt that the police, the guards, the customs agents, even the man behind the news counter where she had bought a Spanish-language magazine, were peering suspiciously at the thin

facade of her disguise. She constantly worried if the g-men had sent her picture to every airport, and prayed that they'd believe Mrs. Williams about her destination. Just the same, she ducked into the first ladies room she came to and put on heavy makeup, accenting her eyes and pulling her hair into a bun, changing into a bright dress, and slipping her feet into a pair of high heels. Those alterations, she hoped, would change her appearance enough to pass any casual inspection. She stuffed her soiled clothes and former identity papers in the trash. Beryl had gone into the room, but it was Bonita who emerged.

She had no assurance that the expensive counterfeits were going to pass muster. But when her new IDs went under the scanner and she'd put her hand in the machine to verify them the light blinked green she couldn't help smiling. Her money had been well spent, the artist had done a good job. The young agent returned her smile and stamped her passport with a cheery "Adios, senorita." Without replying Beryl hastened down the corridor to get on the plane to Cuba. She was on her way. The tension drained away each step of the way.

True relief, however, did not come until the doors closed and the plane lifted from the runway. But that was all behind now, she thought as she sat back and munched on her peanuts. The plane's engines droned, filling the cabin with low level noise that the ubiquitous music could not hide. The Hispanic man beside her went to sleep the instant they were in the air, eliminating the excruciating torture of conversation that would belie her false identity. There was nothing for her to do now except wait for the landing, which gave her time to think about the country she was leaving behind, the people she had known, and, especially, about Weed.

Beryl's feelings were mixed; on the one hand she was angry that he had disappointed her so many times, for his part in Philip's death, for setting her up for Charlie and Jake at the warehouse, for the fact that, with his befuddled brain, he probably didn't understand what he was doing or what he had done. Well, at the last he must have understood and, with that flash of comprehension had sacrificed himself so that she could escape.

But still she wondered; had Weed's final act been deliberate, or had it simply been another accident along the tragic arc of his life? She hoped that Weed had paid his debts to Philip and those students whose lives he ruined. Poor Weed. Poor, unfortunate Weed.

EPILOGUE

Beryl was hard at work on an improved C164 sequence at the Instituto del Sol when the news of the British king's birth came across the wire. The baby boy was not only free of genetic defects, the queen-regent proudly announced, but showed promise of being one of the greatest kings Britain had ever seen. "Time will tell," the BBC announcer added gravely.

Time, *and biology*, Beryl added, would tell.



An Interview with Jack Williamson

by Darrell Schweitzer

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Note: Jack Williamson is someone toward whom, I confess, I feel both a great deal of respect and a certain amount of what might be called optimistic envy. He was born in 1908, five years after the first airplane flight, when people still moved about the Southwest in covered wagons, and has lived to see moon landings and the discovery of planets around other stars. But there's more than that. A certain number of people live to be ninety, but the impressive thing about Jack Williamson is that in all that time he hasn't fallen behind. He sold his first science fiction story in 1928 and was a major name in the 1930s. But most of the big names in science fiction in 1935 were obsolete by 1945. Few people read John Russell Fearn, Miles Breuer, Stanton Coblenz, or David H. Keller, M.D., these days. But they still read Jack Williamson, and even what Jack Williamson wrote back then. *The Legion of Space*, 1934, is still grand stuff, and seems to have invented every element found in *Star Wars* four decades later, save that the Wookiee is just a taciturn chap with a lot less hair. Numerous careers have begun, run their course, and faded in the '40s, '50s, '60s, '70s. I've been around long enough to see writers who were guests of honor at major conventions in my youth relegated to forgotten writer panels.

I've seen many more careers come to an end when the writer's work just stops selling. But Jack Williamson keeps going on, having published significant work in each of the past eight decades.

I think every writer in our field wants to grow up to be Jack Williamson. (Which is the envy and optimism part. We hope our careers will last that long.)

What I was trying to do in this interview was ask the unaskable and unanswerable question, "What is the secret of it all?" I think the results came about as close as we're going to get.

Absolute Magnitude: I'm sure what everybody's wondering about, regarding your career, is how you've managed to keep your writing fresh after all this time.

Jack Williamson: Well, I'm astonished about it myself. I told my psychoanalyst once that it was because my memory was so bad that I forgot everything else and had to keep learning something new. I'm not sure that's true, but I am certainly astonished that my brain still seems to work as well as it does. The imagination still works even when my memory is bad. I really can't explain it, except that I have a lively curiosity and I try to stay alive. I am interested in the march of science and in the new writers I come across. I judge stories for the Writers of the Future contest and teach a college course every spring. I feel happier when I have a story going. As a kid I was very much isolated and got used to living in my own imagination. To some extent I think that's still true. The worlds I invent still become as real to me as the real world around me. I get a real pleasure out of writing when something is going right.

AM: If you look out the window here in Manhattan, you realize that we're living in a Frank R. Paul painting, save that there are fewer helicopters. You're writing for a readership whose perspectives are vastly different from your own. Most of your readers were not even alive in a time when there was no space travel and just take it for granted that the Hubble telescope has imaged a planet around another sun. They've certainly grown up with computers. But you're able to speak to those readers too.

JW: I can't really explain it, other than to say that I'm fascinated with the Hubble telescope and the universe it reveals. I said not long ago when I was being interviewed about religion that science is probably my religion. I am fascinated with how the universe began and what it is and where it is going. The nature of things has always been a sort of mystery story to me, new chapters revealed day by day and month by month in the science magazines. I feel that it's a wonderful time to be here. I am trying to learn as much as I can about everything in spite of the infinity of things to know and the limitations of my memory and grasp. Life is still wonderful.

AM: I've read your descriptions of growing up in an environment very much what we think of as the Old West, covered wagons, cowboys, and no electricity. I don't imagine that most people in that time and place turned to science. So why did you?

JW: I grew up on a hardscrabble farm with very limited opportunities. We were sharecroppers at times. It was a world I wanted to escape. I got away into imagination. I came to see science as a magical instrument of power. It could create the sort of world I hoped to live in or dreamed of. Always since I was a kid I've learned as much science as I could. I had an old two-volume encyclopedia that a friendly teacher gave me. I read the science column in the old *Literary Digest*. I still read half a dozen science magazines. I am excited about the world and where it's going, and regret that I'm not probably destined to see many more years of it.

AM: I understand the first time you read *Amazing Stories* it changed your life.

JW: I sent a story off in the summer of 1928, "The Metal Man." It never came back. I saw my Metal Man on the cover of the magazine before I knew the story had been accepted. Suddenly I knew I was a writer—a moment I'll never forget. *Amazing Stories* fascinated me with the possibilities of travel in space, travel in time, new inventions, new sciences. It opened a new world to me. I wanted to live there and I've been there ever since. In spite of all the failures and disasters and rejections and delays, I am astonished and delighted to be here now, meeting friendly editors and people who remember my stories. My life has become unexpectedly wonderful.

AM: I think what distinguishes your career is that you may be the only author who sold to both the early Gernsback magazines and to *The Magazine of Fantasy and Science Fiction*. We have to admit that most of the writing in the early Gernsback magazines, *Amazing Stories* in the '20s and *Wonder Stories* in the '20s and '30s, was pretty

An Interview With Jack Williamson

terrible. But you got better, and a lot of your contemporaries didn't.

JW: I've always studied better work and done my best to match it. I became a university professor and spent many years reading good literature, studying good literature, teaching great literature. I was learning to love writers like James Joyce, Tolstoy, Dostoyevsky.

AM: Did you ever sit down and say to yourself, "I have to learn more sophisticated writing techniques?"

JW: Many times. I have always been aware that there were younger, brighter, better-educated people in the field. I learned something about linguistics and taught courses in it, taught a course for teachers of English as a second language, taught modern English grammar. I am very much interested in the theory of language, how language acquisition develops in a human being. Language and writing are the tickets to membership in society. It's hard to be off the cuff, but I'm fascinated by the processes of communication.

I have just been reading a book by Edward O. Wilson called *Consilience*. He is attempting to unify all knowledge. He is the creator of sociobiology. His views are controversial, but he makes a lot of sense. I am fascinated with his book and his effort to present all culture as a product of biological evolution.

AM: Do you think you will eventually write a story based on Wilson's theory?

JW: That's a pretty hard thing to do. When a story hits me, it can come from anywhere. I can't very well plan them in advance. When I was trying to make a living out of writing, I used to waste a lot of time and come to a lot of tears because stories didn't work out and I didn't know why. Nowadays I don't try to write a story unless it's something I definitely want to say. That happens only now and then, but it's wonderful when it does. I saw the Lewis and Clark miniseries on TV and wrote a story based on that called "A Purchase of Earth." But I can't do that every day.

AM: Despite which, you seem to be writing more than many writers who may be trying to do it for a living.

JW: It's wonderful when it works.

AM: What is your novel *The Silicon Dagger* about?

JW: The basic idea is that the information revolution has changed the old order, that information science is a silicon dagger aimed at the heart of the old authorities. It's set in a county of Kentucky infested with enemies of the government. They declare their independence and defend the county against the United States Army. It begins when the narrator, the half-brother of a man who was blown up by a letter bomb from Kentucky, goes down to see who mailed the bomb. It was suggested by the Oklahoma City bombing. I voted Libertarian in a couple of recent elections because I wasn't very happy with the status quo. When I heard about the bombing and listened to the militia men, I decided there was a novel there. I keep my fingers crossed, but at least it's sold and is due out from Tor.

AM: How are the militia people treated in this book? I would think that in the aftermath of the Oklahoma City bombing, there would be a tendency to make black-and-white villains out of them, when the real story is more complicated.

JW: I have all sorts of people with different backgrounds. One of the leaders is a computer scientist who has invented a communication security algorithm that the government wants to suppress. They've just put him out of business, so he joins the militia, as do others with gripes of their own, marijuana farmers and enemies of the IRS. I have high hopes for the story, but I am waiting for critics to tear it apart, a critic such as Darrell Schweitzer.

AM: Are the anti-government characters treated sympathetically?

JW: Certainly many of them are. But I try to be fair. The president of the United States is fighting loyally for his country and about to die of pancreatic cancer. He's a sympathetic character, but on the other side.

AM: Do you think we're facing a more organized future or a decentralized future? Many people have suggested that as life becomes more complicated and interdependent, the possibilities of terrorism become greater, as the way a teenaged hacker can shut down the electronics at an airport, as one recently did in Massachusetts—then we're facing a more centralized government in the future, not less.

JW: So far as I can see, this is an unsolved problem. In the novel I decided I didn't know any final solution. The action is based on the discovery of a device which can give anybody total immunity from attack. That opens the possibility of breaking up society altogether, but most of my characters don't want to destroy the United States or the civilized world. The conflict that carries on through the novel to a solution I could live with.

AM: Have you several times in your life already felt that perhaps a really radical social change was about to happen? Possibly you felt this way during the Great Depression or as the atomic bomb was invented. Have you seen it coming?

JW: I have certainly seen trouble coming and been apprehensive about it. I was in the Northern Solomons as a weather-forecaster when the atomic bomb fell, and I wrote in my diary that I wished that it hadn't happened in my time. But we have survived all the years since. I think that the atomic bomb has prevented the couple of the world wars that were happening in every generation and so saved millions of lives. I don't know where the world is going, but it's fascinating to watch it go. I think overpopulation is our biggest problem, one that will be solved either by sanity or by war, famine, and new diseases. I think there are bad times ahead, but we are a rugged species. I think we'll survive. I hope we'll do better, but I'm afraid times will get worse before that happens. It's an exciting world in which to live and a greater spectacle to observe.

AM: Have you found, such as when the atomic bomb was dropped, that your view of science changed? Certainly in the SF magazines of the '30s, science was the great hope. Later it became more ambiguous. Did you feel any of this?

JW: I don't think so, really. I think science fiction saw the hazards of the atomic bomb long before it fell. H.G. Wells was writing about uranium bombs in 1913. My dissertation was about the early science fiction of H.G. Wells and was published as *H.G. Wells, a Critic of Progress*. So I've been aware for a long time that progress was not going to go on forever. Of course science fiction depends on conflict, which leads the writer to magnify the seed of evil. My science fiction has always turned on the potentiality of trouble, but I am also a guarded optimist. I like to

Absolute Magnitude

Contributors

see problems solved. I like happy endings if they can be brought about logically. It's a great game to play.

AM: Can you possibly imagine how your life would have turned out if you hadn't discovered science fiction?

JW: I can't find any very good picture of that. I grew up on a farm and a ranch on the edge of the desert. My brother is still on the original ranch. He's done pretty well with it, but that's not the sort of life I wanted. I feel very fortunate indeed to have escaped.

AM: I think that in the course of this interview you've answered the original question, which is how you've managed to keep your career going when so many of your contemporaries did not. The answer is that you continued to be interested in new things. Some writers get stuck in the past. H. Rider Haggard wrote the same book endlessly. It was fresh in the 1880s, but he was still doing it in the 1920s. But you're describing a new novel that's virtually out of today's headlines.

JW: I've tried always to make each book different. I've tried desperately for many years is to learn craftsmanship. The main thing I've discovered about it is that technique is only a device to enable you to say what you want to say. I've found that I can't write successfully anything I'm not excited about saying. I try to keep alive and discover what I can and write what is really exciting, important to me at the moment. My interests change, but the world is always opening new doors to new possibilities, new discoveries, and new revelations.

AM: Doubtless you were never really in danger of becoming the sort of writer who is obsessed with technique at the expense of anything to say. Remember the comment James Blish made, that science fiction must have content?

JW: In the beginning I felt that the structure of the story was what sold it. Once I thought that if I could analyze a great story paragraph by paragraph and write a new story with the equivalent function and values in each paragraph, I'd have another classic story. That doesn't work. You have to have something you want to say.

AM: Thanks, Jack.



Steve Miller has been a reviewer of music, books, and typewriters; a reporter, a professional chess tournament director, a librarian, an editor, and a resource specialist for a statewide electronic bulletin board system. He is married to **Sharon Lee**, with whom he has written a number of books in the Liaden universe.

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Allen Steele became a full-time science fiction writer in 1988, following publication of his first short story, "Live From The Mars Hotel" (*Asimov's*, mid-Dec. '88). Since then he has been a prolific author of novels, short stories, and essays, with his work appearing in England, France, Germany, Spain, Italy, Brazil, Russia, the Czech Republic, Poland, and Japan. He has won two Hugo Awards and is hard at work on a new novel.

John Deakins is a retired science teacher. He has one novel, from Roc, to his credit: *Barrow*.

Linda Tiernan Kepner holds the distinction of having received more fan mail than any other writer we've ever published. She is the acting director of the Peterborough New Hampshire Town Library (the oldest public library in the world) and an instructor at Keene State College. This is her second appearance in our pages.

Steven Sawicki is the foremost reviewer of the small press. He has written more words on stories that no one will ever read than any other living person.

Joe Mayhew won the 1997 Hugo Award for best fan artist. Before retiring he was the science fiction recommender for the Library of Congress. He writes occasional reviews for the *Washington Post*.

Dominic Emile Harman is a British artist who has just begun breaking into the U.S. market. His work has appeared in *Interzone* and *SF Age*. This is his third appearance in *Absolute Magnitude*.

Hal Clement is the father of hard science fiction and the newest Grand Master. His novel *Mission of Gravity* is generally accepted as the best hard sf novel ever written. This is his sixth appearance in *Absolute Magnitude*.

Darrel Schweitzer is best known as the editor of *Weird Tales*. He has written several books of criticism on genre literature, the most recent of which, *Windows of the Imagination*, is available from Borgo Press.

Gerard Daniel Houarner is a prolific small press writer and the only writer from our first issue ever to make a second appearance. He also edited the Space and Time anthology *Going Postal*.

Joe Lazzaro is the author of *Adapting PCs For Disabilities*. He is currently project director for the Adaptive Technology for the Blind Program housed at the Massachusetts Commission for the Blind in Boston. This is his second appearance in *Absolute Magnitude*.

Bud Sparhawk is a regular contributor to *Analog*. His story "Primrose and Thorn" was chosen for Gardner Dozois' *Year's Best*. This is his second appearance in *Absolute Magnitude*.

Lucas Gregor is a librarian in Seattle, Washington.

Michael Apice is a commercial artist. His work has appeared regularly in *Pirate Writings*. This is his second appearance in *Absolute Magnitude*.



Ganymede
by Matt Doeden

On beaches of Ganymede
vast oceans of ice
like muffled twilight
of shimmering Jovian wonderland
Dim sun
won't you touch me
as I shiver
in glistening methane glow?
Forget not
though you would
that I too
am your child

Far Haze and Distant Thunder

by Steven Sawicki

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This is being written right after the beginning of the new year—1999 in case you're interested. By the time you read this we might be halfway through the year, or we might even be fast approaching 2000. Perhaps this column is sitting in the magazine which is stuck to some printer's press right in the middle of an issue run which was halted by the Y2K bug. Perhaps there are huddled individuals, striving to generate heat by burning these words as they fruitlessly hope the power grid comes back online. Perhaps a lone individual will find wisdom in these pages, change his dictatorial mind and go on to become the greatest leader the years of waste will ever see. Whether it's the Y2K or the millennium which does us in though, you'll need something to read. It gives me great pleasure to think that these words might be used not only for intellectual stimulation but for heat, light, and other, best unmentioned, utilities. One can barely predict tomorrow never mind the near or far future so let me stick to what I do best.

Tales of the Unanticipated #19, Eric Heideman ed., box 8036, Lake Street Station, Minneapolis, MN 55408, \$5, (\$6 Canadian), 4/\$15, (4/\$17 Canadian, 4/\$22 Overseas). Make checks payable to Minnesota SF Society, 80 pgs.

Tales of the Unanticipated, or *TOTU*, is a magazine of the Minnesota Science Fiction Society and is published on an annual basis, typically late summer or early fall. *TOTU* used to come out every eight months but due to financial constraints they've moved to annual for a bit. While the distance between issues has grown longer, the wait is made bearable by the addition of 16 pages of content. The magazine is funded through the profits of Minicon, a Minnesota-based convention—they had a bad year. Still, to my knowledge the magazine is not in danger of collapse and has fairly strong reader support.

This issue opens with the typical editorial and letters column. Editorials are either interesting or not depending on your taste and on whether or not you're a subscriber. Next comes a listing of contributors, and it's

nice to have this up front and in this context since it keeps the presentation of fiction/poetry/non-fiction pretty pure. The first real piece of fiction is "Crazy Dreams" by John Calvin Rezmerski. This is a short short, less than a page, that packs quite a punch. Rezmerski wastes no words and yet allows the full emotions of an individual caught in a strange place of growth to come through. Well done and worthy of study. David J. Hoffman-Dachelet wades in next with "It's Just A Game." This is the old aliens come to Earth in order to judge our readiness to enter Galactic society plot. However, it's not just an ordinary working of the storyline, Hoffman-Dachelet adds touches of humor and makes the whole thing revolve around baseball. I loved it right up to the end when Hoffman-Dachelet seemed to run out of steam and the story whimpered to a close. It's an excellent story in need of a real grand slam ending. Humor runs rampant through John Grey's poem "Windows 3995." Grey has his finger on the pulse (or should I say mouse) of the situation. Great stuff and worth reading and sharing. For example I give you this snippet: "and should your system lock up it no longer disables your entire physical being but allows all body parts below neck level to function normally for as long as it takes one of our technicians to diagnose and correct the problem." Beautiful imagery and quite fitting given the logical progression that Grey is working on here. "Crush" by William Mingin, is a twisted little tale which involves unrequited love, cleavers, wheelchairs, a few roses, and a desperate denial. How could anyone work all of that into a story that is comprehensible and enjoyable? Read it and see; Mingin weaves an interesting story of a young woman trapped on the edge of loneliness. Her prince comes but can she get around his toadiness enough for it to matter? Mingin answers the question with some quiet acts of brutality. An interesting twist with some interesting characters. "Margaret Drabble" by J. C. Rez is one of those quasi-twilight zone kind of tales that works if you can buy into it early enough. I think that Rez took a bit too long to develop the tale, yet the characterization was too brief for me to really get my teeth into. I

was almost there a number of times and then things would shift on me and I'd be back on the outside. Still, this is a one pager and they're tough to do. Rez does a credible job even if it does fall a bit short. Eleanor Aranson's "The Venetian Method" is well written but confusing in that it appears to be pretty much mainstream. It's a historical tale about a man who writes an opera. Most of the story is a synopsis of that opera which is a tale about a monk/accountant. Aranson actually describes an aria in the opera as the dulllest passage in Italian music. Well, if that's so, reading about it comes a close second. Luckily the tale is followed by another excellent John Grey poem, "My Stud Of Neutrinos." Someone should publish a chapbook by Grey. This is great stuff. Steve Keller follows with "A Visit From Doctor Death" in which he takes a rather simple premise and gives it a twist. The characters are quite real and the ending is as cruel and twisted as the story. The essential question comes in two parts—if death is conquered can it also be perverted, and if it is, must retribution then be sought? Heavy stuff done in a dark and moody style which fits the subject matter perfectly. Nathan Walpow's "Sanitation Sends A Man" is an entertaining bit of fluff about an interdimensional garbage problem and an administrative screwup that might just lead us back to the big bang. It's a clutzy tale that will make you wince as often as it makes you smile, but it all sort of works as it chugs along to its smaltzy ending. Not good but not bad either. Middle of the road story placed in the middle of the magazine where it does the least amount of harm. "Everything In Its Place" by Lyda Morehouse is one of those stories that makes you wonder whether the events taking place are real or only happening in the character's mind. I can usually figure it out and that takes something away from the story for me. Morehouse, though, did an excellent job of keeping me in the dark, as it were, right through to the ending. It's satisfying in any case, as she let's us view, if only briefly, the life of a young woman in the city who conjures up something she can't seem to get rid of. Touches of humor help to keep the story in focus. Editor Eric Heideman offers

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up an interview with Maureen F. McHugh which seems to be in two parts, one part from a convention interview and another part from an email interview. An adept interviewer would have been able to weave this together in a less obvious way. McHugh has written some interesting things and it's always somewhat of a wonder to find out just how much of the content of her stories is intentional and how much is accidental. With McHugh's *Mission Child* just published by Avon books in hardcover (should be out in paperback by the time you read this, unless, of course, the world has fallen into the crapper due to Y2K) this interview is pretty timely. Interesting for the insight into the work and the author. The next story is "Jupiter Radios Earth" by Martha A. Hood. The story takes place in a broken down diner on the edge of a highway that no one uses anymore. Here a messenger from Jupiter sits waiting for someone to whom he can deliver his message. The story builds and builds and then ends. Not conclusively, nor with a bang, nor with irony, it just plain, damn ends. I wonder at my intelligence during times such as these. Then I count my fingers and toes and as long as I come up with 18 I figure I've still got enough brain cells operating to review. A few short of the number needed to comprehend this tale, though, and that's the pity because it's well written and offbeat enough to be very interesting. Rhonda Eikamp presents us with "The Never-Never Room" a story about curiosity and about a man who wants to make the wild magic his wife. Eikamp sets the tale in Victorian times or at least gives it Victorian trappings through choice of language and style. This works quit well and it gives us some contextual and emotional placement. The story starts a bit slowly but once Eikamp establishes the characters the pacing falls into place and provides additional mood. An interesting tale with an average ending, which, while it probably could have been better, fit in well with what had come before it. This might just be a question of taste. David McKeag Cox works some wonder with the idea that things can be replaced given the right circumstances. Cox, in his "Keys To The Kingdom (or, Pauli's Exclusion Principle)" lets us watch Pauli as Pauli watches others until he eventually inserts himself into the situation to a somewhat surprising conclusion. This story works because the idea is interesting and the writing is strong. There really isn't much of a plot or much of a character study. Instead, we are moved along by Cox's well crafted words and by the

simple elegance of the idea which forms the grit around which this pearl is formed. As we near the end of the magazine we are presented with "Wild Bunnies" a cute short story written by Patricia Russo. Russo does a good job leading us from beginning to end in an enjoyable way and the whole thing comes off very entertainingly. Sue Isle's "Chadriki Dance" is a strong entry detailing the effect an alien species might have on earth. Isle does an excellent job of creating a truly alien race and in presenting a unique concept of human/alien interaction. It's a wonderful short story which makes some interesting points about what it means to be both human and alien. Robert Levy's "The Proper Study" is a misdirecting tale that involves some aliens who are on Earth doing studies. Seems they're studying each other as well, though, and that's the hook of the tale. Interesting, but ultimately a bit odd as it doesn't really conclude in a satisfying way. We begin, we follow and then we are just left in the dust; craft and elegance over plot and story. "The Story of a Fragment" the penultimate story here, written by Judy Klaas, is about a bee who gets taken over. That's probably more than you need to know. It's an interesting tidbit more for how Klaas does it than for what it does in terms of story. I found it interesting in an odd sort of way. Finally, there is Stephen Dedman's "Miniatures" and I can think of no better story to end the issue with. This story is about Rodin, you know, Godzilla's bud. It's not quite what you might think or expect though, but then, Dedman is becoming known for doing that. This Rodin destroys for art. Dedman can't seem to pass up a wry observation at the end.

And now a word about design. *TOTU* is darn near perfect in its simplicity—plenty of white space, readable text, non-intrusive art (in fact you could argue that no art is needed at all but the people revolt when presented with unending text). This attention to reader comfort pays dividends. It won't make you like a bad story, but it will certainly make you hesitant to drop out too early on a slow developing one. Editors need to know this stuff and Heideman does. With nearly two decades of history behind it, *Tales Of The Unanticipated* is a magazine that has earned and continually earns its place in your hands. One of the must read magazines each year.

Science fiction, of course, is sometimes known more for its predictive ability than for its literary placement. This is an unfortunate distinction—sort of like thinking that murder mystery fiction is actually giving ideas to

criminals. Science fiction (and fantasy and horror) are entertainment first and foremost. Sure, there has been the occasional right on what if extrapolation. Sure, there is the once in a while near miss that makes you wonder. On the other hand, there are millions of words of this stuff produced annually and it's a wonder that more of it doesn't come closer. The truth of the matter is, that for every atom bomb description before its time there are thousands of stories of flying cars; for every moon landing there are thousands of stories about the jungles of Venus and the hollow earth; for every satellite orbit mentioned there are thousands of stories of alien visitation and interstellar flight. Frankly, I'd be happier if they could just predict whether or not I'd like a particular piece of fiction rather than predict the future. Of course, one of the things I'm trying to do with this column is predict which magazines will be around long enough to be worth subscribing to. Funny thing about predictions, time eventually makes you a seer or a boob. Well, at least boob is a step up from village idiot.

Pulp Eternity 9/98, Steve Algeri Ed., P. O. Box 930068, Norcross, GA 30003, \$5.95, (\$7.95 Canada), 4/\$20, 8/\$35 (checks payable to Steve Algeri), 64 pgs.

If I remember correctly, *Pulp Eternity* is a spin-off, more or less, from *Eternity Online* which is an e-zine that has been around for a couple of years and is also edited by Algeri. One can argue that this sort of transition—from electronic to paper—belies the argument that we are and will move in the opposite direction. This is sort of the reality of science fiction making mock of the craft of science fiction which would have us all directly downloading and/or carrying palm readers. In any case, *Pulp Eternity* is a theme magazine. For those of you unfamiliar with the concept it is actually quite elegant in its simplicity. At some point the editor decides what topic or theme he/she wants for future issues of the magazine. Then the editor solicits or puts forth the word that submissions are sought. A few months/years later we have an issue which is thematically crafted. The theme for this particular issue is time travel. Editor Algeri puts forth in his editorial that the magazine will twist classic themes so that readers should not expect just more of the same but a collection of stories which stretch the boundaries of the imagination and which ignore prejudices and limits. There is, of course, only one way to find out.

Far Haze and Distant Thunder

The kickoff story, "Remembering the Menken" by Paul Victor Wargelin, is not the story I would have chosen for an opening. Wargelin's tale is a style piece, written as a first person letter from the late 1800s. Stylistically it's interesting, but tough on the mind and a bit slow. The story is okay, if not really groundbreaking. The next tale, "Appointment at Camelot" by Steve Petrella, would have been a much better choice. It's an end-twister, and while I figured it out quite a few paragraphs from the actual end, Petrella did an excellent job of misdirection and concealment as he wove his story. Julia Morgan-Scott provided a superb illustration for the piece which fit like a hand in a glove. Chuck Rothman's "Punishment" which is the next story in line, is a short-short with a twist ending. The twist ending is the domain of the short-short, and time travel lends itself to twist endings, so this story was quite at home in this magazine. The time travel tale is conducive to character as well and Rothman uses that aspect to his advantage. Bruce Bethke follows Rothman with his own version of the twist in "On The Conservation Of Historical Momentum." Bethke takes a rather unusual device and uses it as the focal point of his tale. It's well written and it was interesting to see where Bethke choose to go with it. The first tale which presents us with historical celebrity is Christopher Rowe's "Long Live The King." This story about a young woman and Elvis is witty, entertaining, and funny. It includes some pretty human characters which you cling to from word one. Well done and with a tag line that will make you stop, scratch your head and then smile that it took you so long to get it. Great stuff. The rest of the issue is representative of the above—some good, some average, some interesting more for idea than style. An interesting mix of stories, although I wonder if the time travel theme might have proved to be a bit too narrow.

The layout of the issue is nicely done, with the editor letting the words prove the worth of the magazine. There is art and most of it is well done and complementary to the fiction. Algieri also uses an internal mix of styles and fonts which works a whole lot better than you might think. There's still plenty of white space and the font is a good size for reading which makes the thing even more pleasurable to pick up.

Fantasy has no predictive baggage to carry. Instead it bears the burden of needing good, clear, and engaging writing. Only then will the author transport us to another world,

regardless of how close that world might be to ours. Science fiction needs to do this to a much lesser extent. We come to science fiction with an understanding of the tropes. We know what stars are and space travel and planets and aliens and some bits about physics and geometry and math. We know less about elves and dragons and magic and mana and spells and gateways. So we are dependent on the writer to keep us entertained and to educate us concerning the rules of their world. Horror is less problematic than either science fiction or fantasy since a good horror writer can literally take his world from next door. We already know about psychos and lunatics and mass murderers and ghosts and psychic phenomenon and haunted places, so it takes the least amount of actual talent (at least in world building and belief suspension) of the three. There are no bad serial killers, only bad writers who fail to capture their pure, inner light of motivation.

Womers And Innuendoes, Hunter Lord and Ariel Masters, Padwolf Publishing, ISBN 1-890096-03-2, \$9.95 (\$11.95 Canada), 283 pgs.

This is a science fiction/thriller novel which takes place in the near future. The world has changed, there are new, deadly diseases, and cloning has become common. These two things place concurrent pressures on society, causing it to react. The reaction, as is usually the case, is not a pleasant one and does not favor the oppressed. The clones, or womers as they are called, are dyed according to their functions: red for pleasure, blue for security, green for labor and orange for research. The clones are considered to be less than human, merely property to be used and abused by their owners, even to the extent that the orange-hued womers are used as living experimental beings. The thriller part comes in the form of an uprising which is in the making.

This is an interesting setting for the novel as Lord and Masters (I know, I know, it's pseudonym time, but I can't tell you who they really are) work their plot around the slavery of the womers and the underground movement which develops and which parallels the underground railroad of the 1850s in the United States.

The novel is broken into fairly short chapters, sometimes congruent and sometimes divergent. This works for the most part, although it is slow going at the beginning, and in some cases it requires you

to carry plot in your head for pages. This can be a lot of work for the reader and it begs the argument of just how much of this whole experience should be reader-based and how much writer-caused. Regardless of your own opinion, it's worth the effort and the movement of the plot from beginning to end is entertaining, amusing, and enlightening. Padwolf publishes other novels and some anthologies which you can investigate if you like this book.

What will the future bring? That question was much more easily answered twenty years ago than today. Change has become exponential. Change has become part of life. Change has become something that creeps from all directions. We have been to the moon, we have found other planets. We are on our way to Mars. We are building a space station. We can clone. We are making a genetic map. We have the ability to build on a molecular level. We can destroy the world in an instant, in a number of ways, with a number of vehicles; and no one seems to care or be concerned by this. As science becomes more complex the mystical becomes more accepted. We have never been more interested in astrology. We have never been more involved in mysticism. There has never been such a diversity of religions and beliefs. There has never been the opportunity to become exposed to so much so easily. There are many opportunities to join the way of darkness. No one seems all that concerned about this. Predicting the future has become a perilous occupation. Science fiction looks more like fantasy every day and horror looks more like every day life with each minute. Perhaps we are merely investigating alternate paths to alternate realities in alternate ways. Perhaps fiction is the welcome mat to these realities, making us ready for every transition.

Adventures Of Sword & Sorcery #5, Randy Dannenfelser, Double Star Press, P. O. Box 807, Xenia, OH 45385, \$4.50 (send \$6 to cover postage for single issues), 4/\$17.50, 8/\$29.50 (in Canada it's \$7.50, \$23.50 and \$41.50), 76 pgs.

Heroic and High Fantasy at it's best, or so says the promo at the top of the magazine. Why review this here? Because it's risen from the small press, because it's got great fiction, and because a steady diet of only science fiction will leave you unbalanced. At the very least this will increase your

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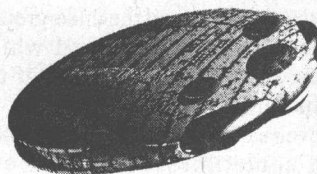
appreciation for fiction based on science and not on folklore.

The first story, "When Centaurs Dance" by Alan Smale, is a murder mystery involving the King's Investigator who journeys to a centaur village in order to investigate the murder of the King's taxman. Smale does an excellent job of setting up the tale and dispersing clues all about so that when we come to the conclusion it hits us with a bang. Great lead off story. Ron Collins, "Ties That Bind" is an equally satisfying story, though it suffers from too many breaks. This is pretty common in short stories that must cover periods of time. The story is about a warrior forced to fight gladiatorial contests and with apparently no way out. Collins characterization goes a long way towards making the tale enjoyable. George Barr's "Bad Ogre and Staunch Friend" which he also illustrates, is a humorous offering about a rather stupid knight and the quest he ends up on. Puns aplenty are splashed throughout the text and they add spice to a story that's quite well done. As with any such effort though the enjoyment is directly related to how one perceives the punning and humor. If you enjoy such things then you will probably enjoy this. If such offering please you not then you'd best avoid it. Well written either way. "The Fading Season" by M. Leigh Martin is a poignant tale of growing old, being stubborn and refusing to let luck come your way. Martin does a great job with the short length of this story, using it to tell what is essentially a small fragment in the lives of two people. It's written succinctly and with excellent use of image and emotion. "Copper Spark" by David Bollinger is more of an idea story than anything else. It's also fantasy fairly well tinged by SF. The tale is about a man whose job is to give civilization a jump start on backward planets. He introduces concepts and skills in ways that create the tension needed for advancement. The story pretty much revolves around this transaction, paying little heed to character, setting or plot. It works and anyone wondering what a good idea story looks like should look here. "Masks Of Flesh And Brass" by Stephen L. Burns is a rather long story about survival and about magic and about being so overwhelmed that you can bear no response. The piece is fairly long—too long, I would posit, for the tale being told. It is an interesting story, basically told through two people in a prison cell. Still, it would have had more snap if 500 words had

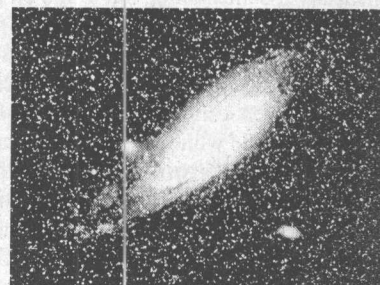
been cut. Burns skill makes the length less problematic than it would be in the hands of a lesser writer. Still, anytime you are dealing with two people basically just talking to each other, the talk had better be about something worth listening to. "Castlefall" by Jefferson P. Swycaffer is another longish tale which weaves a subplot of justice among the story of an assault on a high castle. Again, it seems, the story would have been more enjoyable with fewer words. Still, Swycaffer, like Burns before him, is a talented enough writer to get past this and the word count does not so much hinder the telling as lead one to the path wanting to skip the occasional paragraph here or there.

The remaining stories are told in an equally adept manner and it is hard to imagine a better place to find high and heroic fantasy than here, which makes the promotion tag on the cover true. Each tale is accompanied by decent art and the layout, is straightforward and readable. Editor Dannenfelser also does an excellent job of placement, both leading and ending in strength. A nice effort and one worth supporting.

Because it really can't be said enough, use caution when subscribing to any small press magazine. Diving into the small press should be a positive experience. That experience is all to quickly tarnished by publishers with too much expectation and too little experience. Order a magazine on a single issue basis, at least until you're more sure you want to invest. And with any investment be prepared for the day when you're return equals zero. As always, you can reach me care of this magazine or by email at sfreviewer@bigfoot.com. If you've got something you'd like reviewed you can contact me for info on how to get it into my hands. Understand though that not everything that touches my fingers gets into a column.



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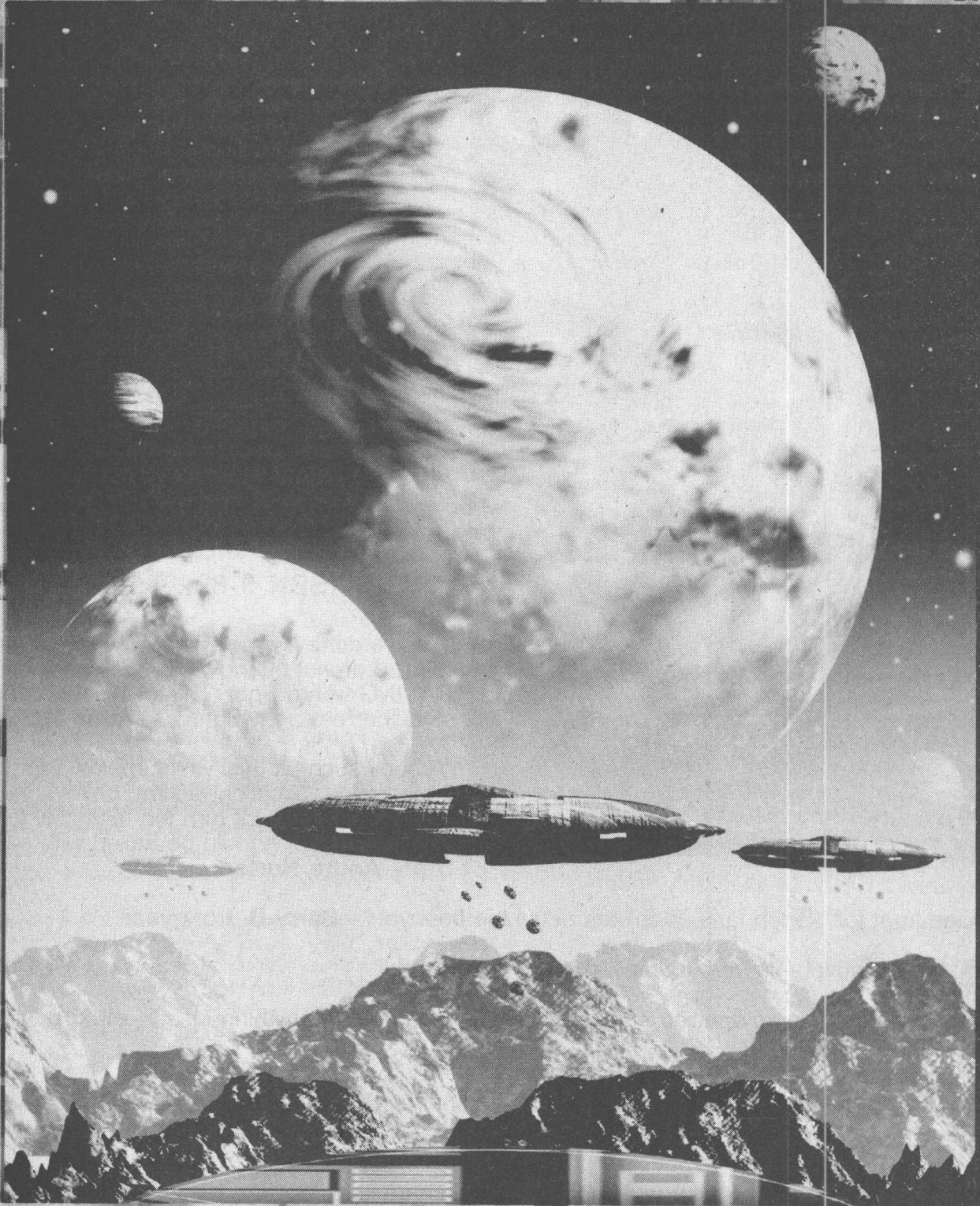
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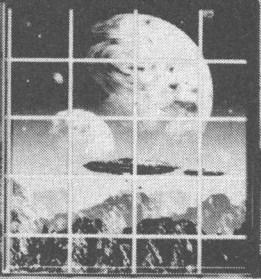
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GARKIN IN RANGE...



Night Patrol

Gerard Daniel Houarner

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Like angels cast out of heaven, Tombour and the rest of the squad were falling out of the night up to Garkain's storm veiled surface. No one had died yet. No one had disappeared. Garkain's boojums were quiet.

Tombour found no comfort in the thought. The night, the storm, the operation were all still virgin.

Crowded between combat robots with the five other Marines in his squad, listening to the clank of assault suits overhead and the groan of bulkheads gripped by storm and entry stresses, Tombour shut down his eyes for a moment.

He hated feeling trapped in a boat on a drop, without weapons to fire, without enemies to kill. He shifted anxiously, metal grinding against metal. He tried to find another place to be, a memory to relieve his tension as he shifted from the numbness of down time on the Garkain Occupational Command Orbital to the excitement of an operation.

But his memories had been recessed. The G.O.C. wanted pure Marines for this op. Metal and flesh, ice and fire, heaven and hell. No purgatory of memory, guilt, regret or satisfaction to distract from the mission.

Afterwards, perhaps, when the op was over and they were safely sequestered back on the Orbital, there would be a taste of the past. For now, they were going down mean and clean.

Tombour took a deep breath. The familiar smells of flesh, metal, and machine lubricant filled his sensors. Like old free-ranging Earth predators, Marines always marked their territory with a distinctive scent. The smell aroused his desire for a little heavy weaponry and a few live targets.

He opened his eyes, slid a cool metal finger over the flesh of his inner arm. Time, perhaps, to retrieve a piece of himself. Time for a hit of his brother's latest memory virus, before he was linked to an AI and his telemetry came under constant monitoring.

Before he could call up the virus hidden in the latest percussive composition his brother Sooronam had sent him, warmth suffused Tombour's chest, shoulders, neck. Ambient signal waves had awakened the repair and enhancement nanites shot into him during the pre-op dressing. As they flooded his organics and instrumentation, new sensors came on-line, registering in the part of his mind that lived in computer implants. A rush of fresh rage, riding the crest of hormonal adjustment, momentarily overwhelmed his unease. His chest muscles twitched with anticipation.

Mission specs came down through Tombour's hard-wired internal comm lines from Squad Leader Ma Tsu, who was sitting safely with the pilot in the control cabin. At the same time, a tactical holograph of the planet Garkain coalesced in the middle of the dimly lit hold. The green dots marking E-Con ships, Orbitals, satellites, stations and the abandoned ground bases blended into the world's swirling mix of browns and greys. Alien artifact sites burned bright red, like multiple eyes peering through the tracking imagery of the storm. The terrible boojum world, so easy to conquer, so difficult to hold.

Tombour looked away from the projection, and focused on the mission briefing filling his internal files.

A live op, down and dirty. Recon sweep to the center of an underground complex was the objective. Squad split, dropped off

individually at six of the many entrances. They were going in along with their remote weaponry, signals shielded in armored cables from landing zones to complex, then combat repeater spikes set at close intervals to boost signals down under and back out to Ma Tsu in the drop boat circling in low atmosphere for pick up. No long range tactical support, no backup. Unusual. Dangerous.

"I love a live op," Baby Shaf said from across the way, then moaned. Cawk, her muscular thighs embracing Baby Shaf's hips, glanced up as she worked her tongue over the rim of skin surrounding a cable socket on the side of his armored neck. She gave Tombour a slight smirk and a wink, and shifted so he could see the tattoo above the flesh of her left breast: "Gimme Sperm and Die." Baby Shaf groaned and pulled Cawk back and forth across the skin-strips on his thighs. Tombour imagined the sensation and wished it was his turn as Cawk's companion. Though he could not exactly remember, he was certain her touch was better than any memory. He looked away, and back inside at the mission specs.

No AI support. Something scrambled AIs planetside. The same thing, no doubt, that had been destroying AIs and making E-Con personnel vanish for the past ten years. The thing they had all come to catch, following Lebi'D after he had chased a tachyon trail from a ruined ship to a world he named after one of his Aboriginal people's Dreamtime demons. And then crashed his ship *Canberra* into the planet.

Aliens. Invisible, or hidden. The boojum no one had ever found dancing in the latticework towers, buried in the underground crypts, or sleeping in the petrified root tangles of long dead vegetation.

"Fuck AIs," Daevas said from the shadows on Tombour's right.

He scanned the niche Daevas had found for himself. The Marine had a water bulb pressed against his forearm skin. A red cloud billowed in the water. Small, dark fish swam frantically in the cloud. Loose flaps of Daevas' flesh waved in the bulb's opening. Daevas raised his free hand, offering another waterbulb to Tombour while glancing at Hara Kali. At the sight of Kali's edges, Daevas' metal and crystalline pupils contracted, and the milky white of his eyes clouded over, losing their shine.

Tombour held up his hand and gave him a nod of thanks for the offer; turned his attention back to the briefing.

Recon only. Look and see, scratch and sniff. But no pissing in the wind. No hard contact anticipated, no biting expected. Priority on clean looks, clear telemetry.

"Bull," said one of Hara Kali's voices. "Shit," said the other. Hara Kali stood. His massive, all metal form glittered like a moving field of stars. Points and razor edges shone with Garkain holographic's reflected colors.

Tombour looked away, but kept his proximity sensors tuned to the fleshless Hara Kali. The Marine's celebration of the machine's cold efficiency by burying organics under armor and razor edges made Tombour nervous even in the Orbital's relaxed environment. Having to deal with a dual personality fusion veiled by a metal and crystalline visage under combat conditions was pushing the fire rate even for Enforcement Service's finest. It was like experiencing all the danger of a fire fight without the excitement. It was like sitting in a boat dropping into a hostile op zone at night.

Absolute Magnitude

He dipped again into the mission specs. Experimental stealth and shielding, augmented telemetry and sensor instrumentation, added to standard issue combat suit, robotics.

"If they say there's nothing down there," Cawk said, slipping away from Baby Shaf, "what are we not supposed to bite?" She stood and stretched. Tombour eyed the long, curving lines of her body.

"Each other," Mad Lion answered from his eyrie among the hanging suits. His eyes glittered in the shadows of the hold's upper reaches. He unwound his body from around his combat suit and hung upside down over Cawk. Bone and metal clicked as his braids swung back and forth. The fleshy tips of his fingers grazed Cawk's shoulder skin whorls. He flashed Tombour a broad smile and a wink. "Or maybe some of that fancy new stuff they put in our suits."

Tombour returned the wink, but couldn't curl his plastiflesh lips into a smile. Tuning into Mad Lion's personal frequency, Tombour heard a raspy singer rhythmically chanting "pressure drop" over a syncopated, old Earth island riff. He closed the channel, envying Mad Lion's joy in music. The Marine was always up, always charged like a fresh battery. Even on down time.

"What's with the weird stealth and shielding, anyway?" Baby Shaf asked, shaking his head as if clearing comm line static. "No record of biologics, so we don't have sensor models to design a stealth array."

No one broke the silence that followed. Tombour grunted. Everyone knew what was going on. No one wanted to say the obvious. No one wanted to take point for a run on the truth. But truth was all they had, sitting in a shaking boat dropping them into the unknown. "Augmented telemetry," Tombour said. "Sounds like we're being sent in to find out what's down there. What works, and what won't."

"I love the fucking Marines," Mad Lion shouted. His deep, joyous laughter nearly drowned out the noise of the boat's descent.

After drop, follow scouted routes to rendezvous point at complex center. Priority on maintaining hard and repeater telemetry links. Monitor bio-feedback. Maintain verbal reporting.

"It says here none of the drone scouts made it out," Daevas said. "How do we know these routes are accurate? What are we supposed to do if we run into a wall?"

Ma Tsu came on line. "Improvise."

"Hope the wall don't grow behind you," Mad Lion added.

"Didn't they find that Survey asshole in one of those underground sites?" asked Baby Shaf. "Mumbling that crap about snarks and boojums?"

"Pay attention, steelheads," Ma Tsu said. "His name was Temil, E-Con hero. Up there with Lebi'D. Only Garkain massacre survivor. Only survivor of an alien encounter, ever. Maybe you circuit dicks join him, become big Network stars."

Cawk spoke up. "I hear he's cracked. Sent on permanent Earth leave. Got him on an island, all to himself."

"Should have made him a Marine, instead," Mad Lion added.

"He should be going down with us," said Daevas. "Maybe he can talk the boojums out of dusting us."

"Mute the chatter," said Ma Tsu. "Suit up. Planet fall in seven t's."

"Hey, Ma Tsu," Mad Lion called as he landed lightly on the deck. "Do we report on the site after we nuke it, or before?"

Laughter filled the hold as the combat suits were lowered. The only voice missing was Hara Kali's.

"If you find anything with sperm, save some for me," Cawk said as she climbed into her suit. "You know how I love to fill Marine creches with fresh young trainees. Saves recruiters the trouble of looking in trash dumps for garbage like you."

Tombour took a last glance around the hold. Daevas pressed a healing plaster over his skin break, then nestled the water globes in the suit foam before going in. Mad Lion slithered to Cawk and licked the skin over her thigh with his mesh tongue as her suit closed up. Baby Shaf sank into his suit's foam with a contented smile. Kali extended a blade from a slot in his forearm and pierced the holograph's southern hemisphere.

As the suit embraced Tombour and connections between his computers and the suit snapped into place, Ma Tsu's face appeared on the faceplate comm display. With lights from the cockpit's displays casting sharp shadows across his jack-studded, cable-veiled face, the Squad Leader looked like a pale, fleshy pearl trapped in a machine web.

"Tombour, check your bio readouts. You're not scanning right. You want a dose?"

Tombour's nerves twisted. His stability profile showed moodiness, tending to sullenness and withdrawal under stress. If Ma Tsu was offering additional hormonal adjustments, he was reading trouble. But dosing would blind him with a chemical fog. The boojum hunt's thrill wouldn't touch him.

"No dose, Ma Tsu," Tombour said. "Just feeling a little out of synch. Need to get this op going, is all." He tried to project an upbeat mood.

"All the same, after the op, check in with the Orbital's Med Unit. I want a full diagnostic on you. Maybe you need tuning back at Io Camp."

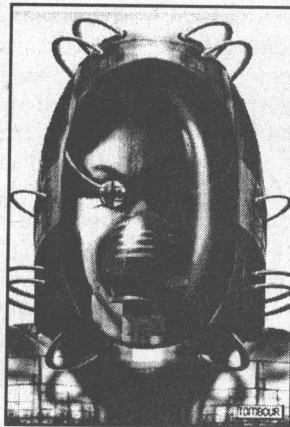
Mad Lion broke in. "Who said we're coming back?"

"Hey, Tombour, don't worry," Cawk teased. "Maybe the brass want somebody strung loose on this op. You know, like Temil. To talk to the boojums."

Light laughter crackled over the comm line.

Tombour gave the squad a thin smile. He engaged the computer part of his mind in routine suit checks, testing links with his combat robotics and suit weapons. Ma Tsu moved on to Hara Kali, who wanted to go down without a combat suit. With everyone occupied in final op prep, Tombour called up his brother's memory virus. He had enough time for a quick hit, a brief immersion in his past. A moment of life before wading into death.

After a final check of pre-drop routines, Tombour started up Sooronam's music. Codes embedded in the dense, poly-rhythmic textures broke through his memory's security. A darkened corner of his mind filled with light. Faces flashed in his awareness like fleshette bursts. He tasted spiced roast meat, smelled sea air. A woman's silk dress brushed against the bare skin of his stomach, which the Service had long since replaced with flex metal. That was the memory he wanted. He reached, sifting through the past. His youth. The time before Marine recruiters saved him from Enforcement trackers and bounty hunters, before he went to Io Camp and lost so much of his flesh and himself. He remembered . . .



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He was kneeling in a service duct filled with thin, acrid smoke. The flame from his cutting tool sent flickering shadows across the wall as he worked his way into the communication cable. Sooronam, grime smeared across his smiling face, straddled the cable where the light faded into darkness. Tangled curls of black hair dipped over his pale forehead.

"Almost done?" Sooronam asked. His upper body swayed and his shoulders dipped and rolled to a rhythm he was tapping on his thighs with his fingers.

"Another t," Tombour answered. A cold bead of thick, putrid liquid fell onto his naked back and oozed down his ribs. A dropping from the Hive's upper reaches. He penetrated the cable's armor, found the optic line he needed and cut it, clipping one end into one of the many jacks on his left arm. He sent a pulse, specially tailored by a sub-Hive programmer. His client had paid him to transmit the pulse. He attached the fiber, with a fistful of others, to the mech techs' latest scrambling box. His client didn't care how he diverted attention from his true mission. So somewhere in a credit data base, a day's worth of charges had been lost, including his client's; and all over the city, credit machines were registering malfunctions and crashing. A little something burping back up from the under-Hive. An interest payment on the bill for the death of their father, who had made his living as a comm junction monitor in the upper Hive until he was cut down by thrill-seeking trashers attacking his post. A reminder that he had not forgotten the other bill he had to pay, for his mother serving a life sentence for tech theft slaved to an AI at an Earth polar satellite tracking station. Everyone had bills to pay. Few could say they enjoyed making the payments so much.

He had barely started smiling when he heard metal on metal. He looked to Sooronam, ready to whisper a sharp warning, sure his younger brother had started tapping out what he heard inside of him on the cable. But Sooronam was still, head cocked, dark eyes on Tombour.

Line monitors were racing to fix the cable breach earlier than Tombour had anticipated. Either more monitors had been distributed along the lines, or defensive programming had been speeded up. Didn't matter. They had to move.

Tombour grabbed Sooronam's hand. They took a few steps along the cable, sent a pair of duffle bags filled with organic waste down a tube, then climbed up into a narrow space between the service duct and the mag bullet tunnel. The monitors hesitated at the tube entrance below. Spindly legs stepped restlessly back and forth. Sensor arrays scanned ceaselessly. Tombour activated a lift to the next Hive level and led Sooronam along another narrow space between ducts and support structure. The monitors split into two groups, one going down the tube, the other chasing the lift up. Three stood over the breach he had made in the cable, repairing the damage he had done.

Tombour remembered every tedious, sweaty moment of the next hour's journey through the dark in-between world of the Hive, evading security drones and sensors, reassuring Sooronam they would be all right, they would not end up like mom and dad. He could feel the tension in his back, the ache in his arms and legs, as he crawled through k's of superstructure before finally breaking out into a pedestrian traffic tunnel.

Only after they had washed at a public bath and stopped at a Q-Eat did Tombour see the women. Three. Older. He was still young. Upper Hive dwellers, skirting the lower depths for a little excitement. Not quite trashers, but they shared the trasher look of blood red metallics and wild, uncombed hair streaked in black and red and gold. Not virgins; the silver filigree on their skin protected them from low-grade energy weapons and physical assault. The designer color dart pistols hanging at their sides were for everything else, including fun.

Tombour smiled at them. They smiled back. One winked at Sooronam, who tapped out an inviting, light-hearted rhythm with his utensils on the table edge.

The girls stood. A lot of leg showed. Sooronam leaned over to Tombour as the girls walked toward them. "You gonna show me how, soon, right?" he asked.

"I think it's better if I let one of them show you," Tombour whispered back. And then the girls were on them, cooing, hands caressing, lips brushing skin, warm bodies pressing—

The memory faded. The reality of the boat's hold came into focus around him. Baby Shaf, Cawk and Hara Kali had already dropped to the surface, and Mad Lion was standing in the doorway, a dark hulk framed by the guide lights against a background of darkness. The boat rocked, veered and banked, trying to fight the storm's grip and maintain its course.

Tombour cursed. Wrong memory. Hard, harsh, except for Sooronam's soft expression, and the girls at the end. That last bit was the one he had wanted. Three Cawks.

He'd slipped. He was losing control. As Sooronam had warned, every pleasure had its price. Perhaps that was what Ma Tsu had sensed: Tombour distracted, losing his edge. Perhaps he did need to go back to Io Camp, for a systems overhaul and tuning. Except that the high level viral filters and security programs would cleanse his brother's memory virus from his systems. And then Tombour

would have nothing left that belonged to him.

Of course, he needed to return from the op to worry about that. He had to concern himself with the moment, with Garkain and boojums and walks in the dark and in the earth of an alien world.

He needed to survive.

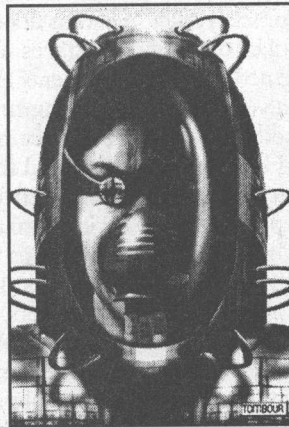
Mad Lion crouched in the doorway. "Hey, Ma Tsu. You sure you don't want to come down with us? You looking kind of pale, lately."

The boat's suit maneuvering arms hoisted Mad Lion through the door. The grapplers released him. He dropped out of sight. A flight of robotics followed him. Night swallowed them all.

Tombour came to the doorway. A hail of particles bombarded his helmet, making a ticking he could hear through armor and insulation. The grapplers picked him up, thrust him out, let him hang in space for a moment. Then he fell.

His stomach lurched and his heart raced as the surface rose to him. The suit's landing para-foil deployed and guide jets fired up, but the storm drove him past his landing zone. He nearly crashed into a rock outcropping, but finally settled on a flat stretch of terrain with a jarring shock the suit could not completely absorb.

Tombour crouched, weapons armed and set to track. Proximity sensors were useless in the storm. Night consumed his flood lights



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after a few meters. He sweated, waiting for something to leap out of the darkness. He started several times when one of his combat robots scrambled into view and linked with him, but resisted the urge to fire at the slightest movement. Nothing attacked him. After a few moments, he anchored his comm repeater into solid rock, sent the repeater's buoy up into the sky.

"Tombour down and secure," he reported to Ma Tsu. "Confirm transmission, op status."

"Acknowledged," Ma Tsu replied, appearing once more on the helmet visor. He frowned as he studied consoles and listened to reports being fed to him. "Comm link clear, op live. What the hell's wrong with you people? Can anyone hit a landing zone? You're too damn close in, every last one of you."

"Hey, I'm lucky I didn't crack my suit open on the rocks," Cawk answered. "It's worse than a fire fight down here. I lost almost a quarter of my support robots just coming down, and we haven't even started."

"Hey, the boojums want us, they bring us closer," Mad Lion interrupted. "So what? We want them, too, so let's get going."

"Shut up and orient your damned selves," Ma Tsu shouted, exasperated. "We revise schedule for this whole op, now."

"Boojums don't give a damn about schedules," Mad Lion muttered.

Tombour sent out drones to map and secure the perimeter. After deploying combat robots to defend the repeater, he looked over the number that remained. He sniffed the suit's sweat-scented air. The cable connecting his suit to the repeater would be thinly defended. A good cable splicer could cut the link and be gone before any machine arrived to stop him. A better one, as he had been, could send a pulse down the line to disable some of his systems and still get away. He wondered what kind of bill he had sent out for payment by landing on Garkain, and what kind of credit he should expect.

The new tactical situation came down from Ma Tsu. All six squad members were almost on top of the underground complex. Their targeted entrances were too far away. New entries had been chosen. New paths through the maze. Tombour waited for the excitement of the mission's danger to surge through him. He searched for the desperation that had allowed him to dance on life's edge in the under-Hive for the credit to survive and find a safer life for himself and Sooronam. He tried to stir up the rage he felt toward the Hive for ripping apart the quiet, comfortable life with his family and throwing them all away like outdated tech.

Instead, all he found was fear. Bio-readouts were skewed, his breathing was labored. He couldn't stop sweating. His legs felt weak and still trembled from the jolt of landing. The pre-op tension had never left. Worse, all he wanted to do was take another hit of memory. He wanted to go back to those girls he had left, to the days

he had felt under control and master of his life. He wanted to remember what it felt like to embrace death for his own reasons, and not the fulfillment of what Command called long-term strategic goals.

Sooronam had warned him. Too many hits, and the past became addictive. Marines had to live in the present. They had to live for the now. Heaven and hell, the machine and the organic, the past and the future, fused together for the explosive moment.

Ma Tsu ordered him forward. Tombour moved his legs, even as a frigid blast of dread stiffened his limbs and slowed his thoughts.

"Don't rush, Kali," Ma Tsu said over the comm link. "Daevas, Baby Shaf, keep focused. Looking good, Cawk. Mad Lion, strong now, but cut the singing. Stay in the loop, Tombour. Dose yourself, do whatever, but stay with us."

Tombour followed the ghostly imagery his terrain guide projected on the helmet visor. It was a short walk through storm and darkness to the complex entrance. Drones were already inside scouting passages, sending back changes in the original map. Too many changes. Tombour wondered how tunnels and chambers could have shifted so much in such a short time. Even construction robots would have had a hard time excavating new passages and filling in old tunnels since the last probes had been down.

His floods illuminated the rough-edged entrance and inner walls. Surfaces appeared to have been weathered and stressed by the elements and tectonics, exposing crimson and yellow veins and opening cracks and vents lined with glittering crystals. There was no evidence of mechanical or manual work, even when Tombour followed the terrain guide on to a new stretch of tunnel. He could have been following a natural cave formation, except that height and width throughout the complex was as uniform and fitted for human passage as the specs for an E-Con ground base.

Data streamed in from Tombour's sensors, through his processors, and up the comm link to the repeater. He watched the flow with growing helplessness. What he saw made no sense. Density, mineral composition, even trace gases had changed drastically. Had they been fed the wrong information on the boat? Was the squad being tested? Sacrificed not to boojums, but to some arcane E-Con psychological experiment?

Tombour called up the memory virus, held it ready even as he caressed weapon triggers and imagined sending volleys into rock walls, down tunnels, up vents. He fought to keep a balance between the urge to lash out at the mystery, and the need to withdraw into his past. The struggle between the two drives calmed his fear, brought him back to the Marine way.

"Hold position for instrumentation check," Ma Tsu said. "Plant your repeater spikes, cut your cables."

Tombour cut his lines, planted a repeater, and set the suit to knock

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down more spikes automatically according to transmission clarity. His robots pulled in their cables, checked in on their own repeaters.

"What the hell is that?" Baby Shaf whispered, same question Tombour wanted to put to the Squad Leader as background radiation, magnetic field and other energy readings suddenly began fluctuating wildly.

"You want a transfer to Intelligence, Daevas, you better get yourself some, first," Ma Tsu barked. Tombour instinctively straightened at the command tone, even as he sensed the Squad Leader's urgency to keep tight control over the squad. "Any positive contact? Suit breaks? Comm lines clear? Then what the hell are you afraid of, Marine? You just taking a walk through soup. Keep walking. I'll let you know when you need to pull out. All of you, move up. Now."

"Maybe he don't like how the soup tastes," Mad Lion said. His voice lacked its usual good humor.

"That's 'cause he needs his momma to feed him," Cawk added, then forced a laugh that died away when no one else joined her.

"Why don't you all just shut the fuck up," said Daevas. The thin, raspy sound of his words reverberating over the comm line silenced the rest of the squad. Even Ma Tsu.

Tombour ran a check on the combat robots guarding the repeater and his perimeter. All functioned normally, as did the probe drones. He went ahead, working his floods over tunnel walls and down side passages. Waiting for the boojums to come.

The tunnel slanted down, curved to the left, forked. The terrain guide told him to take the steep path down. He descended. He reached out, broke off a piece of rock outcropping, squeezed it in his hand. The suit turned the rock to pebbles and dust. But, for all that power, he still felt vulnerable, like a fat database waiting for a nimble little splicer to cut his way into him.

The drones alerted him to a barrier ahead. The other squad members checked in with the same problem.

"Go through it," Ma Tsu ordered.

Tombour pulled in his drones and combat robots and moved up to the barrier. What appeared at first to be solid rock turned out to be a rubbery substance hanging in irregular flaps from a crevice overhead. He sent a probe through and whistled at the change in atmosphere on the other side. Traces of oxygen had appeared.

"I see it," Ma Tsu. "Keep going. Maintain suit integrity. And double your repeater plants. Just in case local conditions change."

On the other side, another wall of flaps greeted him. Posting a combat robot at the first barrier, he went ahead.

"Hara Kali, I said double your repeated plants. And don't move so far up ahead. Kali, acknowledge."

Tombour went through three more barriers, leaving a combat robot at each to secure his line of retreat. A white mist hugged the tunnel floor on the far side of the last barrier. The atmosphere, according to his instruments, was breathable.

"Kali, report your status," Ma Tsu commanded.

Baby Shaf broke in. "What the hell is this, some old E-Con base?"

Ma Tsu broke in. "Everybody freeze. Hara Kali's comm link just went down. Nothing's coming up on the sensors. I want visual checks, now."

"Something's growing on the rocks," Cawk said.

"I see it, too," Daevas added. "I've got some glowing formations, crystalline, coming out of the cracks in the walls."

"Looks alive to me," said Mad Lion.



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Baby Shaf came on line. "I can confirm that, Ma Tsu. Maybe we're running into a boojum nest. Time to shoot?"

Tombour ran his lights down his tunnel and confirmed the environmental changes. He saw nothing suggesting life or intelligence, but was ready to fire anyway.

"Reads like mineral formations on this end," Ma Tsu said. The line went dead for a moment. Tombour checked his cable to make sure it hadn't been broken. When Ma Tsu spoke again, his voice was subdued. "Hara Kali may have dropped his own comm line. Telemetry is dead. Can anybody raise him down there?"

The silence stretched to an uneasy length. Tombour tried every frequency on the suit radio, pushed the proximity scanners to their limit, but found nothing. Sweat trickled down his forehead, along his cheeks, even though the combat suit's environmental controls were operating normally. He swayed on the razor sharp edge between heaven and hell.

"Maybe now is a good time to nuke the place," Mad Lion said.

"No, no," Daevas said, his voice cracking. "Can't leave him down here. Can't leave the Kali."

Ma Tsu didn't cut in right away. Tombour was about to ask for orders when the Squad Leader finally spoke.

"Tighten up, Daevas. Everyone, move up. Advance to the target area. Maybe you'll find him there. Or run into him along the way."

Tombour sent his drones further out and kept the combat robots close by for support. He wasn't sure which he dreaded more: running into boojums, or a rogue Hara Kali.

The mist died away as Tombour penetrated the complex deeper. External temperature rose steadily. The atmosphere gas mix was very close to E-Con specs for all installations. Crystalline structures hung from the ceiling, spilled out of cracks and crevices and vents. Tunnels were filled with warm, glowing light from the crystals: blue, yellow, green, red. Shadows followed every step he took. He divided his attention between the proximity sensors and the suit visor.

"I'm seeing chambers down here," Cawk said. "Small, regularly spaced. Like goddamned little rooms along a corridor."

Baby Shaf came on line. "I've got a fucking stream over here. Source looks to be somewhere below these tunnels. You reading this, Ma Tsu? It's fucking water, is what it is. Real water."

"I got some, too, over here," said Mad Lion. "Big, beautiful pond. Got my external ears on, and I can hear water dripping, calling to me. Feel like taking a swim, myself."

"Keep going," ordered Ma Tsu. "Don't stop, don't break suit integrity."

"Why not?" Baby Shaf asked. "You're not reading any trace poisons or hallucinogens, are you? I'm not. Maybe we're supposed to—"

Security displays flashed red. A warning buzzer came on. Automatic defense systems searched for targets.

"Who's firing?" Ma Tsu screamed.

"Running...something ran down one of the side tunnels...small...teeth, had sharp teeth, such sharp teeth..." Daevas sounded ready to cry. In the transmission background, the click and sputter of firing mechanisms sounded.

"Cease firing. Now. Confirm sighting, give me visuals, Daevas. I don't see anything on the screens up here."

"I saw it, saw it, damn you!" Daevas screamed. "Maybe they got Kali. Maybe they're coming for us. Fuck 'em. Fuck you. I'm going after it. I'm going after them—"

Silence flooded the comm line. Security displays went down to yellow. Warning buzzers fell quiet.

"He stopped dropping repeaters, too," said Ma Tsu, in wonder. No one answered. Tombour took a few tentative steps forward, searching the shifting shadows for small, sharp-toothed things. "I don't know what the hell you people think you're doing down there! Tighten up and keep to the op specs. Let's get this over with. Finish the recon sweep to your target. Then you can pull out. Move!"

Tombour reached his first cluster of chambers. They were long, low, dark. Reminiscent of the tunnels he used to travel in with Sooronam, in the under-Hive. He let drones probe the chambers, passing only a cursory glance over them with the floods. Seeing them brought the temptation to take a hit of the memory virus, to visit his past. To live it again.

The comm link to one of the combat robots died. Then another. The repeaters were operational, but the robots had stopped transmitting.

"Ma Tsu—" Baby Shaf cried out.

"I see it," the Squad Leader replied.

One by one, Tombour lost control of his combat support. Then the drones died.

"Trace the repeater trails," Ma Tsu ordered. "Find out what happened."

Tombour followed repeaters to the closest drone, weapons primed. He found the drone at the mouth of a chamber. Power was gone, though when Tombour opened a service door he found the battery charged. Electronics tested operational individually, but not as a unit.

"Fuck this," said Mad Lion.

"Mad Lion, don't—" Ma Tsu didn't bother finishing his command. Mad Lion had already broken contact.

"It's soft in there," Baby Shaf whispered.

"My God," Cawk cried out. "They're so tiny. I didn't know they were so small..."

Something moved in the chamber beyond the fallen drone. Tombour backed away. A figure separated from the darkness, took a step into a flood light beam. Tombour fired a short burst from his shoulder-mounted gun. Turned away. He did not want to see what he had killed.

"Ma Tsu," he said. "You want me to go on?" Heaven and hell, he said to himself. Fight or flee. Present, or past. Dance on the edge.

"Move up," Ma Tsu replied, wearily. "Cawk and Baby Shaf dropped their lines, as well. Check your target before you fire next time, Tombour. It might be one of ours."

Chambers opened at regular intervals along the path he followed. The closer he came to the target area at the complex center, the more the chambers resembled rooms fitted for human occupation. Walls and floors straightened, became smooth, glossy. Formations within suggested tables, chairs, beds. Luminous crystals gathered at the center of the ceiling, or along the upper edges of the tunnels. The light became uniform, brighter, losing its colors. Tunnels connected at regular intervals, resembling the typical grid pattern of a human settlement. Tombour wondered what the air smelled like.

A large chamber opened before him. Within, streams of water trickled through a wild tangle of brown, green and purple vegetation. Tombour read the sensors, then stuck a probe into the bulbous trunk of a tall plant from which bundles of spindly vines

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grew in thick masses. The probe confirmed sensor readings. Though the chamber appeared full of vegetation, layers upon layers of growth with twisting trunks, leaves broad and thin, vines, needles, thorns and roots, there was no indication of organic life. He ran his armored fingers through a bush of tiny, round leaves, and exposed pink-veined bulbs clustered around the base. He crushed one of the bulbs. Juice squirted on his visor, thick pulp dribbled over his metal knuckles. The rock of Garkain yielded to his touch like Earth-based vegetation. He wondered what the leaves felt like, and how the pulp and juice tasted.

His proximity alarm went off. A figure backed away from the entrance. Tombour started after the figure, then stopped. Mad Lion grinned at him from a stream where he lay, letting water run over his naked body. His skin glistened, his braids glittered with beads of moisture. The metal parts of his body reflected rays of light cutting through overhanging branches thick with drooping, triangular leaves.

He laughed, raised a white, pear-shaped fruit and bit into it. Tombour turned on the suit's external mikes. He heard the susurrant of running water, the soughing of leaves in a breeze, the splash of Mad Lion's foot slamming into the water. Fast-paced music running over syncopated rhythms played from the combat suit.

"Welcome to paradise," his comrade said, raising the fruit over his head. "Jump out of that suit and join me, Tombour."

"Ma Tsu?"

"Let him go. Keep moving."

"We can't leave him here. He's been infected with something."

"We'll send another team to extract survivors. Get on with the op, Tombour."

He thought of what might be waiting for him at the complex's center, what was waiting for him back on the boat, the Occupation Command Orbital, the next op. Perhaps at Io Camp.

"Talk to me, Mad Lion," he said after turning on the speaker. "What are you doing? What's gotten into you? Have you seen the others?"

"To hell with them, Tombour. To hell with Ma Tsu, the Marines, the E-Con."

"What about the aliens? Have they contacted you?"

Mad Lion stood. Water streamed down his body as he held his arms wide apart, as if to embrace Tombour and everything else around him. "Here we are, Marine. The aliens have landed. And aren't we a glorious, conquering bunch?" He laughed, loud and long.

"Put your suit back on, Mad Lion. The boojums got to you. Let's find the others and go back."

"To what, man? All this time, I thought you were alive, somewhere under that armor. But you're as dead as the rest of them. The hell with you, too." Mad Lion dismissed him with a

disgusted wave of his hand, turned his back, and walked like a regal lord into the growth.

Tombour started after him, stopped. He took a step back to the entrance, back to op. Stopped.

"Tombour?" Ma Tsu called to him.

He went out a side tunnel. He called up the old map of the complex and estimated his position, then went after the others.

"Tombour. Don't wander, get back on your track. You're giving the aliens more of a chance to get you."

"Yeah, I'm still on line," Tombour answered.

"That's it. Pull out. Now. Just come back. You're out of there now, Tombour, and there'll be commendations. You'll be on the Network. You can probably get bumped up to some command chair, or retire and make a fortune on entertainment and consultant deals."

"I'm staying with the op, Ma Tsu. Being a good Marine. Flesh and steel, Ma Tsu. Hell and Heaven. Just taking the long way around."

A figure darted across the intersection of a parallel tunnel. Tombour paused, considered giving chase. Panting sounds drew him on.

He found Baby Shaf's suit outside the chamber, next to one of his disabled combat robots. Inside the chamber, Baby Shaf sprawled across the soft, fleshy pink floor. Pale, light blue tubes from the walls connected to the jacks on his twitching body. Tombour could almost smell flesh and sex, with only a hint of metal and lubricant, coming from the chamber.

"Baby Shaf?" he called. But the marine was too far gone in his pleasure to acknowledge anything outside it.

He found Cawk in a chamber filled with small, crying shapes. They were vaguely human, crude, doughy models of infants made from mud. They kicked and waved appendage stumps, bobbed and weaved the warped bulbs that were supposed to be their heads. Darkness yawned in the ragged holes of their mouths.

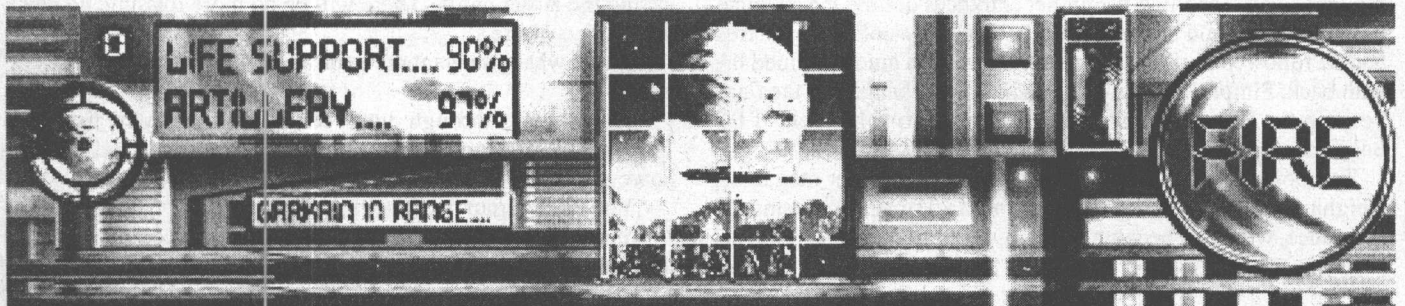
Cawk ignored him as she nestled her babies in parts of her disassembled combat suit. She cooed and sang and spoke softly to her charges, and put their mouths to the jacks on her body. Her metal parts were splattered with dark mud. As she went from one to the other, she scooped up the moist, rich earth coating the floor and stuck a clump on an appendage, on the torso, on the lump of the head. Making them more human.

Tombour left her. Ma Tsu called him.

"This is what you wanted," he answered. "I'm scratching and sniffing, seeing what there is. So you'll know what the boojums are all about."

Ma Tsu did not answer.

He saw Daevas down a tunnel lined with chambers emitting red-tinted light. Daevas lay naked, curled around Hara Kali's metal body. Like Daevas' combat suit, Kali's form was cracked open, hollow.



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A pair of voices mewled from one of the red-tinted chambers. "Daevas." Tombour flinched, hearing how remote, mechanical his voice sounded through the suit speaker. His normal voice, he realized, probably sounded just as mechanical.

Daevas shifted. Spikes and edges from Kali's mechanical body bit into Daevas' flesh, ground against his metal parts. Cradled in Daevas' arms, a small, black, sharp-nailed and long-toothed creature suckled on his fleshy breast.

Tombour turned away, shaken. And came face to face with Sooronam.

His brother. A shock of unruly black hair spilling over his pale, broad forehead, looked down on Tombour. He held his thumb and forefinger out in imitation of a weapon.

"Bang," he said with a smirk.

Sooronam, in typical black, but without a percussion synthesizer or recorder connected to his skull.

Tombour locked on to his brother and fired the shoulder-mounted gun. He scanned the remains, found nothing but Garkain rock.

"Bang right back," he said.

He oriented himself again, headed towards the center of the complex. His fear was a small thing screaming in the back of his organic mind. Alone, it said. Cut off. Lost among the boojums, who were coming after him. His hunger for the mastery, the sense of control and companionship he had experienced in his past gnawed at him. He fought against fear, against the loss of control and the aching emptiness within him. He concentrated on the mission profile, on completing the op. Reach the target. Finish the recon sweep. Go back. He pushed the sight of his comrades, his brother, out of his mind. He was a Marine, and right now he had to use the machine part of his mind to contain the flesh, its appetites, its fears. Keep Heaven and Hell balanced, or else he'd never get out, get back to . . . to . . .

The center of the complex was an empty, oval chamber with a domed roof. It might have been a hangar or auditorium in an E-Con facility. Tombour's steps echoed in the space as he walked to the center. He saw nothing unusual on his sensors.

"Op target acquired, awaiting orders," Tombour said. His voice boomed from the external speakers, vanished down the comm line.

"Acknowledged," Ma Tsu replied. His voice was subdued, almost shaken. As if he had had enough of Garkain. "Objective achieved. Recon complete. We have enough. Now get the hell out. We'll pick the others up . . . later."

Tombour turned to leave. He realized he'd have to follow his own repeaters back past Daevas, Cawk, all the rest. He put the thought away. Scanning the tunnel entrances dotting the chamber perimeter, he found the one through which he would have entered had he followed his assigned route. The terrain guide outlined the path back. Simple, if the tunnels hadn't been changed. If the flaps keeping the atmosphere in hadn't hardened to solid rock. If the boojums were willing to let him go.

Tombour fingered the suit's nearly empty repeater magazine, weighing the risk of being cut off from Ma Tsu against seeing his comrades, what had become of them, once more.

"Great stealth," Sooronam said, stepping from a tunnel entrance. "You couldn't lose a blind rat on a Hive roof with that stuff."

"I guess it won't fool alien eyes." Tombour locked his weapon systems on the figure of his brother.

"You should take a hit of that memory virus I made for you, if you've forgotten."

Tombour's shoulder gun moved, targeted Sooronam.

His brother held a hand up. "Please, you know I'll just come back. We need to talk."

Tombour held off firing. He did not want to blast his way through an army of aliens made in the image of his brother. He needed to hear what the others had heard, to resist what had tempted them. He wanted to be sure he was who he was supposed to be, and nothing more or less. "Who are you?" he asked, at last.

"Who I appear to be. Your brother. Sooronam."

"Bullshit. He's on Earth, in a Hive."

"Well," Sooronam said, with an apologetic shrug, "where he is, actually, is in your head. That's the only place he's ever been. Along with all those memories you've been hitting. They never happened. He, I, don't really exist."

Sooronam's words hit harder than any weapons that had ever been fired at Tombour. "You're lying."

"Am I?"

"You're the Garkain demon, the boojum, the alien."

"I'm only you, Tombour. What's inside of you. This, all of this," he said, with a wave of his arm, "this whole world, is a mirror to the souls of your people. It takes what it perceives, amplifies it, gives it back."

"What? That's impossible. How could you see inside me?"

"Inside you're only patterns of energy. Complex, particularly you Marines, with your mix of organic and inorganic. But patterns can be sensed, decoded, translated. Given time to find commonalities in how realities

are perceived."

"Why?"

"To talk. To connect with other forms of life. To understand others, and through others, itself. In time, it hopes you'll learn to understand its essence, to reflect its soul. Then there'll be communication."

"This is static. What about all the people missing, all over space, all over this world. Your kind took them, didn't they? Why? Don't give me this talk about souls. What did you do to them?"

"This entity did not understand. It took a long time, in your terms, to realize you were all individual units, not small pieces of a greater whole. The intent was to perceive through sampling, tasting the larger entity. There will be no more missing, no more destruction of life."

"Is that what you want me to bring back to command? A truce offer?"

"They know, through your comm link. They're listening. They're free to hear, or not to hear. What you and I want, however, is something else."

"You're trying to trick me. Like the others."

"You've already been tricked, Tombour. Your commanders did that, in the Marine creches. Raised you, trained you, constructed



Night Patrol

and programmed you into a fighting machine with human instincts, human drives and passions. They gave you tools, gave you power. Then they gave you memories of a life you never had, to give you passion, fire. The Marine edge. Cleaned out the dull, routine memories of training and creche-life and combat exercises. Scraped away the dull, sheltered soul. Planted memories of wrongful deaths, loss, persecution, loyalty, protection. The experience of those memories shaped a new soul. But the soul is trapped inside of you, between heaven and hell, metal and flesh, pleasure and pain. It lives in a cage. It wants to be free."

False memories. The world fell away from him, shifted out of focus. He was floating in space, adrift, abandoned.

"But . . . the virus, I can remember you . . . my brother giving it to me . . . warning me . . . and the updates he sends..."

"Tombour," Ma Tsu called, gingerly. "You know—" "Shut the fuck up."

Sooronam spoke. "You know it's true. You can feel the dead spaces between the memories. The blanks."

"I can't remember everything, every little detail."

"You know, or I wouldn't be here. That new soul of yours knows. But it's afraid. Coming into the light, breaking out of the cage, is a risk."

"Afraid of what? I'm not afraid. I'm a Marine."

"You're afraid of what's beyond being a Marine. Change, unknown territories, new life. Death."

"This is some kind of test, an E-Con experiment. You want me to stop being a Marine, to give up my duty. To surrender. But I won't. I know what I am. I won't give myself up."

"I don't want you to give anything up. I want you to find me, and the other memories, and where they fit, what they mean. Live with the memories they gave you, not in them. Make new ones and keep them. You see, I want what you want."

"All I want," Tombour said, relaxing in the combat suit, feeling the tension drain from his body, "is to go home."

"You've never had a home. It's time for you to build one. Here."

Tombour looked around the empty space, at the tunnel entrances. "And wind up like the others?"

"Different souls, different homes. Is Mad Lion unhappy? Cawk? Baby Shaf? Even Daevas, and Hara, and Kali. They've all been set free. They live in the worlds that were made for them. Perhaps later they'll explore the other realities around them."

"How do I know you're telling the truth? How do I know this is even happening? All the sensors read is Garkain rock."

"You don't. All you can do is feel the emptiness inside of you. Feel your hunger for real memories. Feel your need to settle into a solid part of yourself, instead of dancing on edges and grasping at roles given to you by those who created you." Sooronam lowered his head, gazed at him through half-lidded eyes. "You know I speak the truth, Tombour. I am a part of you, don't forget."

Tired, Tombour wanted nothing more than to sit down, sleep, and wake up someplace far away where decisions were made for him. But he stayed awake. He kept his balance between impossibilities.

"Ma Tsu?" he called.

There was no answer. The repeater links to the cable were clear, and the cable was intact all the way back to the first repeater and buoy. All connections registered as clean. Telemetry was still being sent, and received at the other end.

"Ma Tsu, are you there?"

"Yes." His voice was flat, guarded.

"What do I do?"

There was another moment of silence. Then Ma Tsu said, "You have your orders."

"Is that all I have?"

This time, Ma Tsu did not break his silence.

"Stay," Sooronam said, gently.

Tombour disconnected the comm line. One by one, he shut down his weapons, stealth and environmental systems. He stopped the sensor probing and recording. The air in the suit became stuffy, hot. He cracked the helmet open, then the rest of the suit and finally stepped out.

Sooronam walked over to him. "You know you're as much an alien among your kind, my brother, as in this place is."

Tombour grunted. "Perhaps we can teach each other to talk to them, then."

Sooronam nodded, and led Tombour out of the chamber and into the tunnels, into the complex beneath the earth and the Garkain night.



Have Any Thoughts?

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of the
Dark Ages



Fig. 1 The Detail speaks in the thoughts of wisest men

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Have Spacecraft Will Travel

By Joe Lazzaro

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For the price of about 100,000 bucks, you could be lounging in space with your significant other by the turn of the century. Civilian tours to space are rapidly becoming much more likely for many baby boomers alive today, thanks to space launch technology developed during the Space Race, not to mention new systems coming online.

The Soviet/American Cold War began before World War II died out, and gave birth to the Space Race in 1957 with the Soviet launch of Sputnik. The cosmos soon became the province of cold warriors and intelligence analysts playing a deadly game for superpower supremacy. If you weren't a test pilot, astronaut, or scientist, you didn't have the right stuff to fly on government-controlled spacecraft, and that was that! And if you want to put a payload into space, you'd better be prepared to pay about \$10,000 per pound to get it there, and wait months or years under NASA's tight shuttle schedule. These hard but true facts of life are often more than enough to discourage any individual or organization having an interest in working beyond the Earth's atmosphere.

But nearly half a decade has passed since the dawn of the Space Age, and many factors that govern the current regime have changed. The Cold War is over, and the military-industrial complex that served them is looking for new markets. One possible future scenario is to divert current aerospace industries from a war footing to a civilian one, but that will not be easy. The current crop of space launchers can put material into space for about \$10,000 per pound. It doesn't take long to figure out that at that price putting anything into space is going to cost millions of dollars. At ten grand a pound, putting a 150 pound man into orbit will cost about 1.5 million bucks, far out of the reach of all except the very rich! But before we start putting tourists into space, we're going to have to develop launchers that can put mass into orbit for considerably less than ten grand per pound. With the next generation of launchers currently on the drawing boards, many industry insiders believe that we can drop the cost by at least an order of magnitude if we avoid using expensive government techniques and adopt a new

lean-and-mean skunk-works mentality. If these future-minded space companies have their way, it may be possible to buy a ticket to orbit by the dawn of the next century.

In this article, I'll spotlight the major players in the dawning space tourism business, visionary companies staking everything they have for a bright new future among the stars. I'll also highlight companies that are building the next generation of inexpensive spacecraft that will help us make space a routine theater of operations.

ZEGRAHM SPACE VOYAGES

If you've longed to travel the unbeaten path to the cosmos, you can sign up with Zegrahm Space Voyages for a trip to space for just under \$100,000. The company has been specializing in travel to exotic places on Earth such as Antarctica, Africa, the South Pacific, and Madagascar, and has high hopes to be the first company offering tourists a piece of the real high ground. If you have the financial resources, you could be one of their first customers. According to Zegrahm, trips to sub orbit will begin no later than December 1, 2001. Interested parties can leave a refundable \$9,000 deposit to secure their place in the sun. Passengers will wear spacesuits similar to those worn by the shuttle astronauts, and will have about two minutes time to frolic in zero gravity.

Zegrahm is designing its own spacecraft to meet the needs of the tourist market. Their space vehicle consists of two parts: a jet launcher, and the passenger-carrying Space Cruiser. The Space Cruiser will hold six passengers and a two-person crew. The Space Cruiser is first flown to 50,000 feet altitude by the jet. At that point, the Space Cruiser separates, and its independent rocket engines are fired. The rocket engines boost the Space Cruiser to an altitude of about 62 miles above sea level.

What do you get for your money? Zegrahm is offering what they call a total space experience, starting with a compressed astronaut training program, culminating with the flight to space. Your experience begins with a seven day training program that includes lectures and demonstrations on the

current state of the art of space flight. You'll spin in a centrifuge to simulate G-forces and changing gravity. You will also be fitted for a space suit, yours to keep after the voyage is complete. Just like an astronaut, you'll study extra-vehicular activities as you prepare for your mission of zero gravity.

Twenty-four hours before flight time, you will be taken on an inspection of the Space Cruiser, where Zegrahm personnel will familiarize you with the controls in the passenger compartment and spacesuit. The suit is fitted with a helmet mounted video camera, recording your every move. You can monitor flight progress from the suit readout visor that shows speed, vector, and other information. On flight day, you will ascend to one-hundred kilometers, while your expedition leader points out sites of interest. As you float free in zero gravity, you can snap pictures of the wonders of space through your photography friendly viewport.

At the end of the flight, you will attend a grand celebration, honoring your ascent to official astronaut altitude. If you were wondering how you were going to pay for all this, yes, they do accept credit cards including Visa, MasterCard, and American Express. (Don't leave the planet without it.) All this for a mere \$98,000 per person. For more information, you can contact Zegrahm Space Voyages by phone at 888-SPACE66 or on the net at www.spacevoyages.com.

INTERGLOBAL

If you hanker to go to space, you can increase your odds by getting the same hands-on training as NASA and the Air Force by flying in an aircraft doing parabolic arcs. The plane is first put into a dive to gain speed, followed by a two-gravity pull up lasting about ten seconds. The pilot then idles the engines, and the aircraft goes into free fall for about thirty seconds, enough time to perform useful maneuvers and experiments.

But don't worry if you're prone to motion sickness. For those unlucky space travelers with weak stomachs, Interglobal offers complementary puke bags on every flight.

Have Spacecraft Will Travel

If you're strong of stomach, this could be a lot of fun, and great résumé fodder. You can take the Interglobal course(s) for about \$2,000. The tuition includes a lecture series, ground school, and all flight training course materials. You will also receive a flight suit and a video of your experience.

Interglobal conducts the two-day course at the Weaver Aerospace Flight Test Center at Gowen Field in Boise, Idaho. You will learn weightless stability procedures, and discuss space habitat design techniques. You will have the opportunity to perform astronaut like tasks while floating free. You will learn how to translate down a handrail. (That's astronaut talk for pulling yourself along the handrail in zero gravity.) Once you've mastered that useful skill, you will practice transferring a mass along the hand rail, and practice with various foot restraints. You will perform maintenance tasks in zero gravity, and practice and evaluate handwriting and computer keyboarding tasks. You will also be permitted to perform your own pre-approved maneuvers and experiments while under weightlessness.

Although the course is designed to benefit engineering professionals, it would be useful for scientists, students, educators, artists, space buffs, anyone interested in a once in a lifetime experience. The company hints that taking the course can increase your confidence and chances in landing a future job in space or in one of the aerospace companies. If you want to work in space, the course could be a valuable addition to your resume. But you must pass a Class III FAA physical before you can board the aircraft. Interglobal offers different flavors of the course, depending on student requirements. For more information on the courses offered, contact Interglobal at 307-739-1296 or on the web at <http://www.interglobal.org>.

THE CIVILIAN ASTRONAUTS CORPS

If you want to be an astronaut, you don't have many choices for your career path. You can apply for an astronaut post at NASA or with the Russian space program, but they're accepting very few applications at the moment. Don't hold your breath, especially if you're not a scientist, test pilot, or military officer. On the other hand, you can sign up with a civilian organization promoting access to space by ordinary individuals, not super heroes. The Civilian Astronaut Corps is dedicated to getting civilians into space, bucking the system that says you have to be a government-trained astronaut to fly to orbit.

The CAC is contracting with Advent Launch Services to build an inexpensive passenger-carrying launcher, which will be used for short tours to sub orbital space. The CAC is seeking applications from 2,000 people who will each pay a \$3,500 membership fee to ride the CAC rocket to 70 miles altitude. The CAC rocket will accelerate vertically to twenty-five-hundred miles per hour, then coast in zero gravity for about two minutes. For more information, you can visit the CAC web site at: www.phoenix.net/~advent/civilastro or send electronic mail to cac@phoenix.net. You can write to the Civilian Astronauts Corps at 403 NASA Road 1 East, Suite 2000, Houston, Texas 77598,

ROTARY ROCKETS

The Roton is a single stage to orbit (SSTO) spacecraft, currently under development by Rotary Rocket Company. Rotary Rocket hopes that they will be able to use the Roton to cash in on the multi-billion dollar space market that is expected by space analysts in the early years of the next century. The company estimates that over 2,000 satellites will be launched during the coming decade, and has high hopes to have the Roton ready to serve this growing market. With expected costs of \$1,000 per pound to orbit, the Roton could also capture a significant chunk of the looming space tourism industry that only waits for the day when inexpensive transport to orbit becomes reality. Because of its single stage design, the Roton is totally self contained, and does not drop booster stages on its climb to space.

The Roton takes off vertically from its launch pad, much like a conventional rocket, the way god and Robert Heinlein intended. When returning to Earth, the ship deploys helicopter-style rotors in the nose, landing much like a chopper on its tail. The rotating blades are expected to provide a slow, controlled landing, its cargo bay loaded with treasures from space. Rotary Rocket hopes to employ the Roton for deploying satellites or for returning men and materials from manned or unmanned space facilities. Built for easy maintenance, the Roton will have a similar maintenance schedule to that of commercial jet aircraft, with a turnaround time from landing to launch of only one or two days. The Roton is powered by a rotary RocketJet aerospike engine, designed by Rotary Rocket, that burns a combination of liquid oxygen and jet fuel. The aerospike engine is a hybrid, combining the features of jet and rocket engine technology. The

rocketjet engine rotates around the ship's long axis, providing the force to pump the fuel into the individual combustion chambers. Using this design, the Roton does not require expensive and complex pumps used in such spacecraft as the space shuttle and other conventional rockets, lowering the cost dramatically and increasing system reliability. A lightweight composite airframe contributes to the Roton's expected high performance. Rotary Rocket is located in Redwood Shores, California, and has manufacturing and test facilities in Mojave, California. You can reach them on the net at <http://www.rotaryrocket.com>.

PIONEER ROCKETPLANE

Another contender for the coveted space launch business is Pioneer RocketPlane with its Pathfinder spaceplane vehicle. According to Pioneer, the company hopes to use Pathfinder to capture significant portions of the satellite launch, global same-day package delivery, and space tourism markets.

Pathfinder is a spaceplane that takes off from a conventional runway, and blasts into space like a rocket. Once Pathfinder reaches an altitude of 30,000 feet, the spaceplane mates with a tanker aircraft, and takes on about 130,000 pounds of liquid oxygen. The liquid oxygen is used as the oxidizer in the kerosene/liquid oxygen burning rocket engine that takes the spaceplane the rest of the way to orbit. After Pathfinder separates from the tanker aircraft, the pilot fires the rocket engine and heads for space. The spaceplane climbs to an altitude of about 80 miles, which is above most of the Earth's atmosphere. At this time, Pathfinder is traveling at about Mach 12. Pathfinder is about the same size as a fighter bomber, and can hold a crew of two. The spaceplane is powered by two Pratt and Whitney F100 engines and one kerosene/oxygen-burning RD-120 rocket engine. Once the rocket engine takes Pathfinder to the brink of space the payload bay doors open, allowing the cargo to be deployed. This is accomplished by firing a small solid rocket booster upper stage with a satellite attached. The satellite then boosts itself into a stable orbit atop the rocket upper stage. Once the payload has been deployed, the pilot closes the payload bay doors, and makes preparations to return the ship to the landing site. Once Pathfinder has reached the lower part of the atmosphere, the pilot lights the turbo-fan jet engines. The spaceplane can then be flown to any conventional runway for a safe landing.

Absolute Magnitude

According to Pioneer Rocketplane, the Pathfinder spaceplane is a safe technological bet because it employs proven engine technology in the form of the Pratt and Whitney F100 turbo-fan jet engine, and the Russian-built RD-120 rocket engine. Pathfinder also utilizes off-the-shelf structural and materials technology to further lower the cost and risk factors.

Pioneer Rocketplane hopes to use Pathfinder first in the constantly expanding satellite launch market. Once Pathfinder has proven itself reliable as a satellite delivery system, Pioneer plans to expand the size and scope of the spaceplane to a passenger carrying version. Passenger versions of the Pathfinder would have amenities for carrying passengers and could represent a multi billion dollar per year industry early in the next century. According to Pioneer, the airline industry is expected to spend about 20 billion dollars per year acquiring new aircraft during the next few years. With its supersonic capability and trajectory, Pathfinder will be able to fly anywhere on Earth in about one hour, significantly reducing the transit time to popular locations such as the Pacific Rim and other far away places. If you want to take a jet to Hong Kong or thereabouts, you'll spend about 15 to 20 hours locked away in a conventional jet aircraft. In an increasingly competitive business world where time is money, rocketplanes that can get to the Pacific Rim in under an hour are going to be very attractive alternatives for busy business people winging their way across the globe. If Pioneer gets its rocketplane off the ground, you might just find yourself jetting your way into orbit or to some faraway destination in the early years of the next century. Pioneer RocketPlane is located in Lakewood, Colorado. You can reach them by phone at 303-980-0890 or by electronic mail at scott@rocketplane.com.

THE ARTEMIS PROJECT

If you're a space enthusiast, the thought of living on or visiting the Moon conjures up great excitement. Following in the footsteps of the Apollo Project, Artemis is a long-range plan to settle the Moon, and to use lunar resources and the space environment to make a commercial profit. While they're making money hand over fist, one of the loftier goals of Artemis is to help move the human race off this rock and into the solar system, and to supply the developing space industries with lunar metals, water, and other raw materials. With the recent discovery of water ice on the Moon, the equation for lunar

settlement has changed forever. You can make drinking water and rocket fuel from Lunar ice. All you have to do is boil it out of the rocks and soil. That's easy and cheap to do with all the free solar power hitting the Lunar surface. To make the understatement of the century, this radically lowers the cost for setting up bases on Luna.

The first step to setting up a permanent base starts with the Reference Mission. This flight is similar to the Apollo mission to the Moon, except a lot cheaper and with more modern hardware. The Reference Mission will place a crew of up to four men and women on the Moon for up to two weeks to test flight hardware, and to leave a permanent habitat on the lunar surface. The Reference Mission will also check out the orbital transfer ship which will take the Artemis crew to Lunar orbit, and will put the basic infrastructure into space and on the Moon, which can be used by subsequent missions. This infrastructure consists of a tugboat that will carry the crew from Earth orbit to lunar orbit, a lunar lander, and space habitat. Future missions to the Moon will not need to bring up the lunar transportation system, nor the lunar lander. They will bring additional construction, manufacturing, and scientific equipment to expand the lunar base, and to bring up more personnel. Artemis plans to use the US Space Shuttle to loft the lunar tugboat and lander to Earth orbit, but are prepared to use other launchers when they come online, especially if they offer a more economical ride to orbit.

Artemis takes the traditional space settlement/exploration theme one step further, also planning to take advantage of the entertainment and product aspects of space technology. The founders plan to produce movies, television shows, and documentaries about lunar exploration and life in the space environment. They also plan to roll out video games, toys, books, software, and, yes, even a magazine!

Artemis magazine specializes in fact and fiction that focuses on life on and around Earth's nearest neighbor—Luna! *Artemis* Magazine is published by LRC Publications, Inc. They are currently looking for stories and fact articles.

The Artemis Project is looking for people to build the dream. You can help build a spacefaring community, and perhaps one day live on the Moon. Getting involved now may put you on the ground floor of one of the most impressive potential projects of the next century. With the discovery of water ice on the Moon, settling Luna is a lot more economical and safe. The Artemis Project is

divided into two spheres of interest: the Artemis Society International, and The Lunar Resources Company. The Artemis Society International is a not-for-profit scientific and educational institution dedicated to researching every aspect of building a self-sustaining lunar base. The Lunar Resources Company is the profit-making arm of Artemis and is interested in developing products for sale to fund the flight hardware and base construction. You can join the Artemis Society for a mere \$35 per year, which includes the monthly newsletter *Pleiades*. The address to inquire further is Artemis Society International, PO Box 4878, Huntsville, AL 35815. You can also reach Artemis by electronic mail at artemis@asi.org or visit their web page at <http://www.asi.org/g/adb>. You can find out more about the Lunar Resources Company at PO Box 590213, Houston, TX 77259-0213. You can browse their web site at <http://www.ltrc.com>.

HALFWAY TO ANYWHERE

Joining volunteer organizations may broaden your knowledge about the space environment, and may even increase your chances for getting into orbit and beyond. A good place to look for information is on the web, and I've used the web pages of all the companies in this article to good measure. You can also join newsgroups related to space. Just type "in sci.space" and hit enter from your Unix shell account. This will show you a list of space-related newsgroups. Or point your browser to any websites mentioned in this article. With all this in mind, here are several space activist organizations.

The Space Access Society is a pro-space lobby group with only one purpose—to promote cheap access to space. SAS believes that we can have reliable single-stage-to-orbit ships flying to and from orbit within ten years, and a lot of people in the space community think they're right. You can read the Space Access Society web page at <http://www.space-access.org> or by electronic mail at space.access@space-access.org.

The National Space Society is an educational organization whose main mission is to spread the word about space settlement and commerce. The goal of NSS is to promote a spacefaring civilization. You can reach the NSS on the web at www.nss.org or by electronic mail at nsshq@nss.org.

The Space Frontier Foundation is offering a \$250000 cash prize for space businesses. You can reach them on the web at

Have Spacecraft Will Travel

<http://www.space-frontier.org> or by e-mail at OpenFrontier@delphi.com.

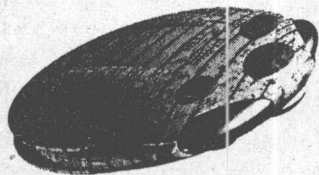
GETTING THERE FROM HERE

When you think about going to space, do you still see images of tall fiery rockets blasting off the launch pad like the ones that carried Apollo astronauts to the Moon? Dr. Jerry Pournelle labeled rockets "shrinking totem poles" in his science columns. The bulk of the Saturn Five Apollo spacecraft was fuel, and the only part of the ship that returned to Earth was the tiny command module. The rest of the craft was left in orbit, burned up in the atmosphere, crashed into the ocean, or left on the Lunar surface.

Unfortunately for us, the government believes in gigantic space projects that employ tens of thousands of people from every Congress critter's district in captivity. NASA is thus building the VentureStar single stage to orbit shuttle as a follow-up to the current Space Shuttle program. While it is a step in the right direction, we need much less expensive and complicated ships to settle space. For more information see <http://www.venturestar.com>.

If we're going to have space tourism and eventual commerce, we need economical launch vehicles, ships that can put a pound into orbit for less than \$10,000. We need launchers that are reusable and relatively inexpensive to operate. We must have launchers that can be run in the same manner as jet aircraft. Next generation launchers must be maintainable by a handful of mechanics in greasy coveralls, not a standing army of 20,000 strong like those who help launch the NASA space shuttle. The problems are not all technical in nature, and legal thorns cloud the space tourism future. A solid legal regime must be extended to include ownership of extra terrestrial bodies.

The companies discussed in this article have one thought in mind—to turn a profit creating inexpensive access to space. If they play their cards right, you might be taking a job or a vacation in space sooner than you think!



Dear Sirs,

I enjoyed issue #11 immensely. I liked (and disliked) John Deakins' piece on making time travel work. The whole point of time travel stories is not about the physical means to bring it about (if I could make time travel work, I can assure you that I would be personally viewing Lola Montaz's famed Spider Dance rather than writing SF). Time travel stories are about the juxtaposition of modern outlooks against ancient settings. The granddaddy of all time stories, *Connecticut Yankee*, involved someone physically traveling to King Arthur's Camelot through a blow to the head. What ever works, I suppose.

Sincerely,

Robert A. Raymond
Orlando FL 32803

—Robert, John was exploring the physical realities of time travel in his article. I don't believe he meant to imply that stories that didn't take the concepts that he covered were invalid only that they are essentially fantasy stories. His point was that if you wanted to write a hard science fiction time-travel story you have to take into account physical realities that are usually ignored.

Dear Warren,

I've been inspired by the work you've done with *Absolute Magnitude*, by your motivational fires to improve the state of the genre, and when you "put your money where your mouth is" by making a commitment to re-revive *Weird Tales*.

Thus far, I've picked up *Absolute Magnitude* at the bookstore, but realize that very little money gets back to the publisher that way . . . and your work certainly deserves to be supported. So here's my check for a subscription. Keep up the good work!

I'm curious. What kind of arrangements did you have to make to regain the name *Weird Tales*, and about how much did it cost? (Not enough to be too much of a financial drain, I hope.) Just curious: if you can't or prefer not to say anything about it, I understand.

All best,

Letters Column

Cliff Hong

—Cliff, thanks for the kind words. By now you probably already know that we've also taken over publishing Pirate Writings and Aboriginal SF. It is my intention to leave the genre a much healthier place than I found it. As to getting the Weird Tales name back, I made Weird Tales Limited an offer that I thought was fair to both of us and they agreed to let me use the name again. We pay them a percentage of the gross, so the amount changes from issue to issue.

Dear Warren,

Thanks for all the good reading in issue #11. I especially liked "Balance of Trade," "In the Winds That Sleep," and "Fiona." Also Allen Steele's and Steven Sawicki's articles were very interesting.

Congratulations to you and Angela Kessler on your marriage. Two editors—well, that sounds like a good match to me.

Live long and happy!

Sincerely,

Ms. K. L. West
Mesa AZ

Dear Warren,

I enjoyed the stories in *Absolute Magnitude* #11, especially "Balance of Trade" and "Fat Guys in Space"; and "In the Winds That Sleep" had a good premise and ending.

I see that in your next issue is a sequel to "Planting Walnuts," a story that I really liked, as I recall, and also another Liaden story. Enclosed is my check for a subscription to *Absolute Magnitude*.

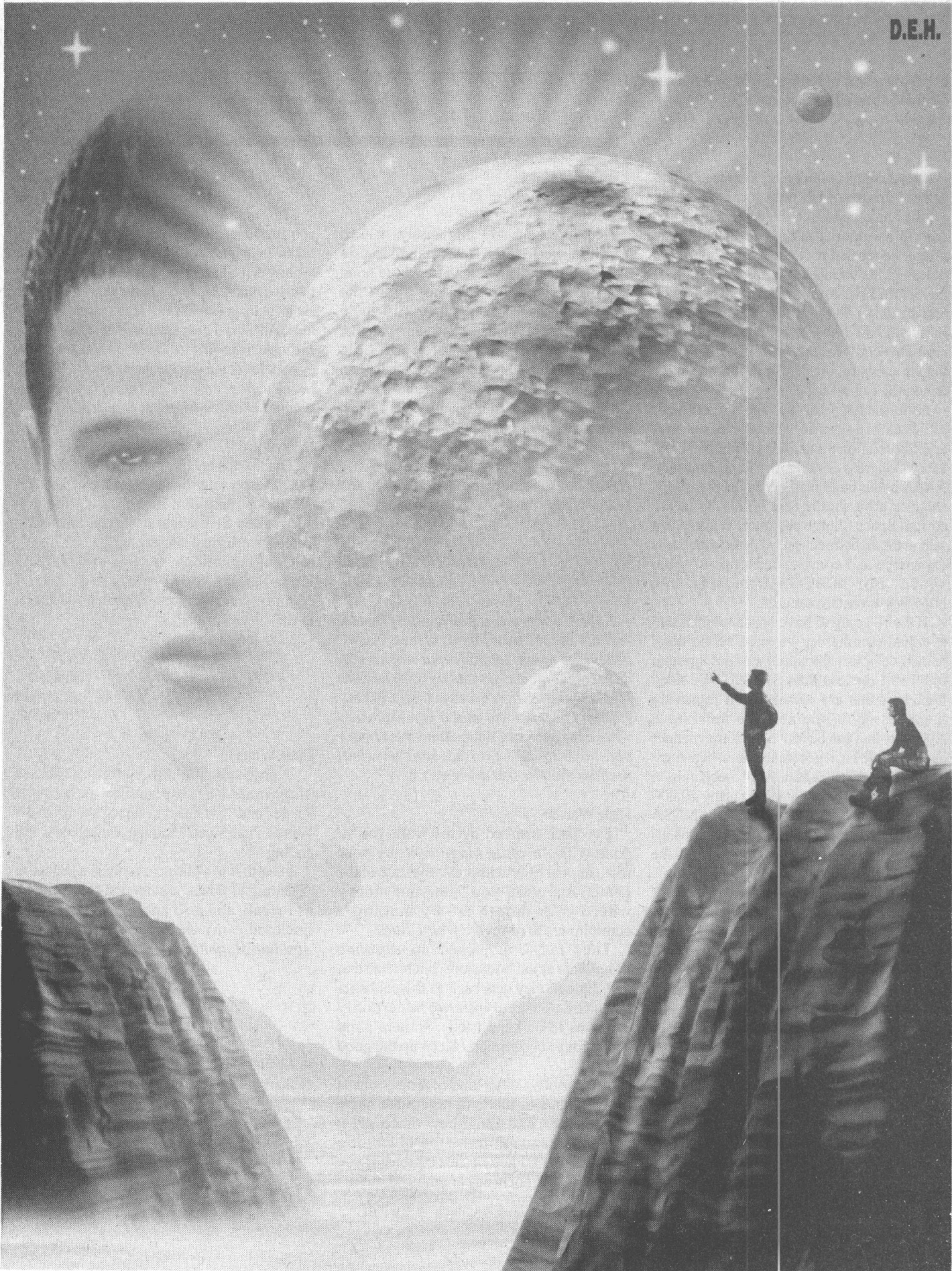
Appreciatively,

Joy V. Smith
Lakeland FL

—Thanks Joy, We do our best to keep our readers happy.



D.E.H.



Deep Walnuts

Linda Tiernan Kepner

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I padded down the short corridor to Gonderjhee & Co. The bulkhead door slid open to admit me.

Sam Byner, office manager, blinked away sleep and motioned me over to his desk console. "What're you doing, awake at 0200, Brannon?"

"Still haven't adjusted to civilian time." I got coffee and sat down near him. "Why aren't you getting some sleep, like the girls?"

He kept one eye on his console monitor. "When you reach my age, you don't need as much. I'd rather watch the universe go by. Besides—" he eyed the screen—"I've been watching incoming ships. There are two that haven't identified themselves—Son of a BITCH!" he snarled, and reached across his desk. He brushed everything into a packing crate parked right beside it.

I was already on my feet. Sam's constant suspicions were paying off. I couldn't believe it. "Who, K-Law?"

"Yes, Goddamn them, with a Fleet cruiser. Grab your gear, find Cyntoj, get down to the ship and stall. We *can't* lose that ship. I'll get the others. Go. GO!"

I tore back to my cabin. I was in boots and jacket without thinking. Years in the Fleet had made the rest of my packing premeditated, too. I jammed the button on the cabin next to mine. I expected what would scare the shit out of anyone else: a menacing, two-meter-tall Tyrellian, weapon in hand.

"K-Law," I said, "haul ass. Sam says we've got to hold 'em off at the ship."

The voice was Tyrellian, but the words were soldiertalk anywhere. "Go. I'll cover your flank," said Cyntoj.

I tore down the space-station corridor to our little docking bay, and hit the personnel-door switch. Along the way, I had seen the Kamarand Law ship docking at another bay. They'd meet the Fleet security team first. We might have five minutes.

The hatch of the S.S. Rustbucket—I mean *Ridstock*—was open. No one was on board. I raced up the gangplank, straight to the control room, and began warming up the engine. Rustbucket was steady, but she was slow. Damn. Only three-quarters fueled. I hit a radio switch. "Alfie, it's Gonderjhee and Co. Disconnect the fuelcharger line. I may have to leave in a hurry."

"What the heck, Brannon, you just got here. Doesn't the lady let you sleep?"

"Don't argue, just do it. And do me a favor—tell Central Control that we'll be launching in five to ten minutes. Do it on the QT, will you? I wouldn't want to confuse them with any conflicting messages."

A long pause. "Gotcha. Say, Brannon, some interesting patter coming over the squawk."

"Don't believe everything you hear." A thought occurred to me. "Say, Alfie, don't I have an emergency jettison code? In case this rickety old engine goes critical?"

"By golly, Brannon, I think you do. I assigned it to you days ago, and forgot to log it in until just now."

I grinned. The grin faded as I took a good look out the front panels. The personnel-door was wide open now. Quick-marching across the bay, in my direction, were a line of pasty-looking humanoids wearing the black and silver uniforms of the Kamarand Law Enforcement Agency. With them were uniformed ConFed

Fleet security men.

I slid down the gangplank. My pistol brought the parade to a halt. Shooting a broad-beam pistol in a spacestation airlock was a felony. "Don't make me use it, boys and girls. I'm a real desperado."

A K-Law officer stepped forward, flourishing a piece of real paper. "I have orders to impound this ship."

I glanced at it. "This says property of Mrs. Mary Ann Gonderjhee. This ship isn't her property. It's the personal property of Kikken of Razdan." I eyed the young Fleet officer, and elaborated, "*Admiral Kikken Razdan.*"

The Lieutenant looked startled. I had hoped for that. He didn't know these K-Law bozos were trying to impound Fleet property. That put a whole new light on it. "Captain," he said to the K-Law guy—

"These discussions," said K-Law severely, "can wait until this ship has been impounded and processed. I have the order, and I have Fleet cooperation on this matter. Put away your weapon and step aside, or I will arrest you."

"And you get a commission on property you've stolen. Not a chance."

"Guard!" he snapped. A uniformed K-Law cop moved forward—

Whack! He was spread-eagled on the deck and stayed there, unconscious. A stone skittered across the flooring.

"The next one," Cyntoj announced quietly, sling in hand, "will have more bite to it. Johnson, haul him off, would you?"

The young Lieutenant's eyes glittered. "Yes, sir." He pulled him to the entryway, himself. "Glad to see you, sir."

"I wish I could say the same." Cyntoj held his belt-sling in firing position.

"Who are you, sir?" The K-Law officer demanded imperially.

"That, *sir*," said Lieutenant Johnson, "is Captain Cyntoj Smantek. You should have heard of him."

"Come talk to me for a moment, Johnson," said Cyntoj. I could see Araee, Mrs. G, and Sam coming toward us. Sam pulled a dolly loaded with the entire office. Mrs. G carried only one item—her rifle. I put my pistol away. There was no need for me to slog away, with a sharpshooter on the premises.

"Sorry, sir, I can't, not on an arrest assignment—"

"— and I shall tell you how you ended up with this shit job," Cyntoj said evenly.

Johnson braked. He looked at K-Law. He looked at me. He looked at the rest of Gonderjhee & Co. Then, in a very changed voice, he told Cyntoj, "I can give you five minutes."

"I will only need three." Cyntoj drew him aside.

I wondered how Sam, Araee, and Mrs. G were going to get to the ship without K-Law stopping them. K-Law cops were paid on commission, judging by the value of the bacon they brought home. Rustbucket was therefore a prize. "Impounding and releasing after discussion" was the joke.

Sam gestured. I hoped I understood. I dived back up the gangplank, and into the control room as fast as I could go. One inside. I hit the switch to drop the cargo lift door.

"*Whee!*" I'd understood, all right. A bald, meter-high Denebian girl rode that cargo dolly smack through the assembled soldiers,

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knocking them left and right—into the cargo lift, which I clamped shut. Araee was on board. Two . . .

Sam Byner tore through the middle of the disorganized posse. One took a grab at him. I saw the flash from the rifle as Polly Gonderjhee delicately shot a small patch on the offender's arm.

That left Mrs. G, the pretty, dark-haired English surveyor with the rifle . . .

"Gentlemen, ladies, I would greatly appreciate it if you would step aside." Not taking her rifle from firing position, she motioned. "That far bulkhead would be ideal. Captain, I am settled with Kamarand Station. Any bill collector from Kamarand who thinks he can collect more from me, just because he sees I have a ship, is in for a rude surprise. Any attempt to take this *Fleet* ship will be considered an act of piracy, and dealt with accordingly. By me. This instant. Do I make myself clear?"

"Must be clear," I muttered with a grin to Araee, who had taken the seat behind me, "they're moving out." We watched them step away. Mrs. Gonderjhee walked to the gangplank, and waited.

The Lieutenant and our Tyrellian had finished their conversation. Swiftly, Cyntoj crossed to Mrs. G. I watched them safely inside, and shut the hatch.

Sam appeared, looking anxious. "I just tried to get clearance for us. They won't let us go. We're under arrest."

"Relax, Sam." I powered up the rest of my console.

Cyntoj slid into the co-pilot's seat. "I only got us a five-minute lead. Are we loose?"

"Working on it." I glanced back to see Mrs. G take the remaining seat. "Going to be a rough ride," I warned her.

"But it's a ride," she said grimly.

I expected that. I spoke to Cyntoj. "Hit the hull breach alarm."

"Oho." He slapped a button, and all hell broke loose. Alarms rang all over the ship and the bay. A mechanical voice began repeating, HULL BREACH - ENGINE OVERLOAD - STAND CLEAR - STAND CLEAR - PLEASE CLEAR THE DOCKING BAY FOR EMERGENCY JETTISON. While the message repeated, we watched everyone in the docking bay scramble for safety.

"Oh, dear, Gonderjhee and Company," Alfie's voice singsonged over the speakers, "you have a terrible engine problem. I'm afraid I can't override an emergency jettison, not even for K-Law salvage rights. You're even showing some radioactivity."

"We're hot, all right," I agreed. "Thanks, Alfie. See you in the next life." The deck gave way beneath us, and docking-bay atmosphere and all, we dropped into the dark night.

A little pale arm wafted a mug of coffee in front of my face. Araee's other arm wafted a second mug to Cyntoj. I drank appreciatively. "As long as we've got the essentials, why worry about minor details like fuel? Thanks, chickie."

"Part of the service," Araee chirped. "Coffee and compliments to Mr. Brannon and Mr. Cyntoj first, Polly said, then we deal with the rest. Are we out of the system yet?"

"Two minutes," Cyntoj replied. "The *S.S. Big Sky* is just leaving her bay. By the time she catches up with us, we shall be out of K-Law's reach."

"How'd you soap that Lieutenant?" I asked.

Cyntoj stared out the viewpanel, stony-faced. "I told him something he wanted very much to know. He was part of the last class I ever taught at Academy. Don't worry about Johnson. I can square us with him. We must find somewhere to land."

"Preferably with fuel," I added.

Araee nodded. "Polly and Sam are working on it."

Sam took my place at the console so I could get some chow. As I stepped inside the mess door, I smelled the wonderful smells of bread and eggs—parathas and ekuri. Mrs. G cooked a mean breakfast, one of the benefits of civilian life I hadn't expected. When she married Gonderjhee, she learned all the habits of a good little Hindu housewife, and hadn't given them up just because the universe had crashed down around her ears. Now she sat at the table, staring at a viewscreen before her.

Looking at Mrs. Mary Ann ("Polly") Gonderjhee made me feel that life wasn't fair. I was almost 40, I could take it. She was twenty-six. She'd worked hard, married for love, cut herself off from her people, been deserted and left destitute, escaped "indenture" at Kamarand Station, taken the worst survey jobs on the books, had half her staff shot out from underneath her—and now, K-Law had stolen the profit. It must have been her religion that kept her pretty face free from worry. I rooted for her "seven years of faultless virtue" to get her annulment from that bastard Ravi, wherever he was.

"Still hot in the pan, Mr. Brannon," she said.

I scooped up ekuri and a tomato slice, got a couple parathas off the breadpile, and sat down. "How bad is it?"

She focused on me instead of the screen, smiled, and patted the oilskin packet next to her. I understood. Scrip. "All that was in the account was this month's office rent, and fuel money."

"Both which Bay Station will fight for, and win."

Mrs. G nodded. She understood my concerns. "Most of this scrip is earmarked for fuel and maintenance. It is ironic. If we owned this ship, we'd be in prison now."

"Ironic but not funny." Cyntoj helped himself to the last of the ekuri and parathas, and slid into the seat beside me.

My taste buds were ringing. "These are real eggs!"

Mrs. G smiled. "I stowed them with my socks. I had the food supplies split between the galley and my kitchen, so we didn't lose much." She stared again at the screen. "But we need a job."

Uh-oh. That meant the Confederation Joint Service list of survey projects, the jobs that no one else would take. Her logic, though, was ironclad: the money was fabulous, and most of them were outside the law's reach.

"If you and Sam can assemble a proposal in two hours, we can send it back to CJS with Johnson," Cyntoj suggested. "I radioed him." At Mrs. G's stare, he repeated what he had told me. "Johnson was one of my students. He's all right."

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"How do you know for sure?" I asked.

He looked uncomfortable. "Classified information."

"You're not an officer any more," I pointed out.

"So I'm not." He paused. "If he wasn't all right, he'd be on a heavy cruiser, not a garbage scow like the *S.S. Big Sky*. There is major trouble brewing in the Fleet. Possibly a government coup."

"Impossible." My jaw dropped.

"Very possible, for the right people. I want to be as far away as I can manage when the shooting starts. Some of the players are Tyrellian, but I am a 30-year Fleet veteran. Both sides question my loyalty. It's best for me to be beyond range of all of them."

"What is our ship's status?" Mrs. G asked him.

Cyntoj shook his head. "Between systems."

Once again, Mrs. G didn't waste time asking unnecessary questions, a trait I admired. She stared at her screen. "Given our fuel, food, general direction, and legal requirements, I've narrowed it down to thirteen. They all pay about the same, and have equal handicaps."

Cyntoj wiped out his mug with his napkin. He got a surveying marker. When I saw him pull out the K-Law injunction, I grinned. He tilted the screen enough to see it, wrote quickly, tore off strips, and dropped them into the cup. "The scientific method." He handed her the mug.

Mrs. G passed the mug to Araee, letting her do the honors. Araee pulled out a strip, and read, "Amlaki Five."

Mrs. G watched thoughtfully as Cyntoj rose and dumped his cup at the trash. Then she said, "Araee, dig up the forms. Mr. Brannon, hurry your meal, please, so I can have Sam back. Mr. Cyntoj, survey supply inventory. We have only an hour to submit this proposal." We were back at work.

Johnson got the proposal in plenty of time to shuttle it back to CJS for us, which meant we were up to our eyeballs again. We started organizing all known information on Amlaki 5. As usual, "survey supply inventory" became something more than that. It became our method of stacking the odds in our favor.

The miners of Amlaki 5 originated from fifty different worlds. They had always believed in saddle justice, not ConFed regulations; but trade barriers had made them stop and think. To trade on an equal footing, Amlaki 5 had to be a ConFed member. To become a member, they had to make concessions: up to three Fleet bases allowed, a proper census, a representative mapping of the terrain of each continent. That was the problem: Pangaea.

Pangaea was the continent that even the miners, hungry for the minerals of Amlaki 5, couldn't beat. It was rotten with earthquakes, volcanoes, mudslides, and gas fissures. There was a permanent, impenetrable cloud cover. Miners and survey

teams vanished there. No respectable surveyors wanted to touch it.

So of course we were going there. A seller's market and no ConFed law. Who could resist?

I found Cyntoj ensconced comfortably in the survey supply locker, doing inventory. "Why don't we just shoot ourselves now?"

"You said that about the last job," Cyntoj observed.

"It's still pertinent. How do we look?"

"Supply-wise? All right." Cyntoj pulled a couple of walnuts out of the locker, and a tool I didn't recognize right away—a riveting machine. "I have some ideas on these. I'm going to experiment."

"Just don't blow us up, huh?"

A quick smile. He *was* loosening up. "Mrs. Gonderjhee's idea. Pangaea's surface moves. We must plant these sensors more than a decimeter deep."

"We won't be able to hear them," I objected.

He frowned at a walnut. "That's the other half of the problem." He looked like a man anticipating a congenial task.

The small, self-powered survey sensors, which we called "walnuts," were an important part of the surveying equipment of Gonderjhee & Co. Planted in the ground along our travels,

a kilometer or so apart, they acted as an electronic grid. They announced their relative height to our base camp (i.e., Sam and the ship) and announced any interesting electrochemical activity in their vicinity, such as metallic deposits or water. We reinforced those readings with topographical surveying and the evidence of our own eyes and recorders. The walnuts were harmless, low-power transmitting devices—at least, until Cyntoj started

tinkering with them. Few things in the universe are more dangerous than a Tyrellian with a gadget and an idea.

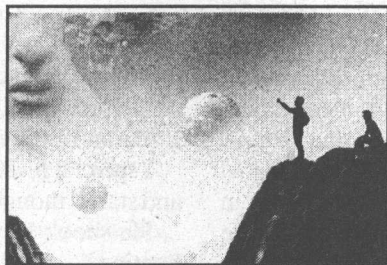
"That will work," he murmured to the inside of a walnut. "By the time I finish, we'll be able to patent this. A little patent money wouldn't hurt the company, either." Like me, he was now a five-percent owner.

"Glad to see your mind's on the job," I needled. The look he gave me was worth the jab. Then he realized I was putting him on, and handed me a walnut.

"Cork it and reverse that wiring, dogface." Like I said. Soldiertalk is the same all over the universe.

The land slid sideways. I hopped back on the hydro. "Move it, Kamin."

Kamin, the Amlaki 5 miner who was my buddy on this trip, vaulted to his machine as well, and hit the switch. It rose from the ground on its cushion of air. Our two one-man machines used their built-in gyroscopes to maintain their position while the ground slid away beneath us.



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"I *am* damned," said Kamin through his mask. "I would've said we were way off the mark. No wonder we haven't been able to map this place. She knows her stuff."

"I knew that already." In the distance, I could see two others from our team, clad in yellow allweathers, with masks. Their heights told me it was Mrs. G and LaFarge. "Glad to see you're figuring it out."

"I thought to myself, what's this chick doing, making a presentation to the Miners' League, when she's got a soldier and a Tyrellian in the background? Then, when she started layin' it all out, I could see why. She has a brain—and she's a looker. Who's she paired up with?"

"You touch Mrs. G and we'll all rip you apart. Mark." I stopped the hydro again, hopped off, and picked up the gadget that used to be a riveting gun. I loaded a walnut on the end, pressed it to the ground, and blasted. That walnut was a good meter below the surface. I hopped back on, and we moved. On top of which, I had an itch inside my suit, someplace that I couldn't possibly scratch without a struggle. It wasn't worth it, because sure as I stripped that much, there'd be another gas blast, and I'd get a face full of hot methane and fry my skin.

We dodged a sudden geyser blast, just ahead of us. The terrain looked like the last Rift I crawled through with a rifle, back when I was a grunt. It hadn't been fun.

"Don't worry." Kamin picked up the conversation where we left off. "I don't mess with chicks carryin' rifles."

We were on our tenth day from Pangaea's rim. Sam was at the coast in the Rustbucket, acting as our sea-level base station. The first couple of days in, on the rim, were uneventful. It gave us a chance to road-test our escort from the Miners' League. The four miners had been on teams that surveyed the rim, or in base camps in Pangaea. Their pals had never returned from the interior. Mrs. G had encouraged the miners enough to promise us cooperation. Their condition was, four miners must accompany us. All right, we agreed, we could use the firepower. Firepower against what? Against anything that might be out there to get us, we answered.

They gave us eight land-sea hydrofoils that we promptly souped up. We made sure the miners' allweathers were as good as ours. We also checked their weapons and told them what we'd expect from them in the areas of support and sentry-duty.

Night was falling. We reached a cliff line. I saw Mrs. G's yellow-sleeved arm raise, a gathering signal. We were the last to get there.

Kamin looked straight up the cliff. "How we goin' to hop that?"

Araee and Cyntoj exchanged glances. Cyntoj tilted his hydro back, and hit a switch. A grapple hook shot forward from the front housing, trailing a length of cord. The hook embedded itself about halfway up the gigantic cliff.

Araee was already hitching her hydro to his. There was a whirr of his built-in winch, and both hydros jerked up off the ground, cushioning themselves against the cliff wall. Up, up they slid. We watched them reach Cyntoj's hook, and watched Araee fire hers and take over. They crept up the cliff and out of sight over the cliff edge.

"Next," said Mrs. Gonderjhee to their two buddies.

Their eyes were bulging. "Get them to toss us a rope."

"No. They'd have to dismantle their winches. Go."

LaFarge, Mrs. G's giant buddy, growled, "So are you sissies scared of heights?" He slid forward, grabbed Orso's hydro by the tail, and hitched himself to it. He stomped the tail back at an angle. "Shoot."

Orso shot. They repeated Araee and Cyntoj's maneuver.

I grinned and said to Kull, "If we live, you'd better put LaFarge in the Miners' League before he kills somebody."

"I was thinking that," said Kull.

We camped at the top. That was something else they hadn't understood: six mats in one tent. "Two are always on sentry duty," I explained, "and the other six are together for safety. Even the girls." Now, after a week of this, they understood.

Kamin was good company. He wanted to learn Fleet ways. "I still don't know why you bother with sentry duty," he said. "There's no living creatures on Pangaea. There ain't even trees or plants. It's just mud, steam, and gas."

"It pays to keep up the habit," I replied. "Then, when you need it, you don't screw up. Sometimes sentry duty comes in handiest when you don't realize you need it."

I woke to a sound that made my eyes snap open. Mrs. G was sitting up, too. "Is that what I think it is?" I asked her.

She nodded and stood up. "Tyrellian vocabulary."

Cyntoj and Kull were staring at the hydros. I didn't get it, at first. Then I saw. There were seven.

"When did it disappear?" Mrs. G asked in surprise.

"I don't know," Cyntoj snarled, "and it's mine. My tools and a quarter of the walnuts."

I spoke a few heartfelt words, too. Mrs. G stepped forward and stared thoughtfully at a blank patch of ground. "No marks."

He shook his head. "We left the motors on. They were floating."

"Not them. Living creatures."

We all exploded in protest. The miners were loudest. "Ain't no goddamn living creatures on this planet except us! We've been here for 25 years and haven't seen anything! Nothing on life-sensors—no contact—"

When we yelled ourselves hoarse, Mrs. G said, "I'm right."

"How do you know?" I asked, with a sinking feeling that maybe she was.

"You said other miners had disappeared. I'm sure they came from various planets, didn't they? Out of all the races—what's special about Cyntoj—and therefore, his hydro? What makes *him* unique? He's physiologically different. *That*," she asserted, "takes a living being to sense."

We redistributed the walnuts and the gear. Cyntoj rode with Orso. I didn't like the situation, and neither did Cyntoj. The earth had opened up and swallowed a hydro. We'd never felt or seen anything. Mrs. G hadn't commented, but I saw that she had the safety off her interphase rifle. The miners were nervous.

Another earthquake and mudslide. I struggled to keep my position with Kamin. The rumble was deafening. Gas spewed forth, blotting out the sun.

Deep Walnuts

Everything settled. We regrouped with Mrs. G. As the sky cleared, we looked up to see two suns. "Heavy gases," Cyntoj reported. "Both suns are illusions. Don't use them to navigate." We moved on, relying on our instruments, stopping every kilometer to blast a walnut into the soil.

Araee skidded over to me. "I'm not picking up any readings from the walnuts we just planted."

I tried to get a test reading, too. Nothing. The others skidded over to join us.

Mrs. G turned to Cyntoj. "Change the frequency. They mustn't match what's in your missing bag."

I objected, "Sam will think we've disappeared."

"No. It will stump him at first, but he'll hunt around for a different wavelength. It *will* tell him that we've encountered trouble."

I have spent more pleasant times than I spent sitting on a hydro in full suit, in the broiling sun, squinting in murky air and breathing through a mask, holding bags of walnuts and watching Cyntoj recalibrate each exactly. I could feel sweat running down the inside of my suit. It felt like bugs. Standing still gave you plenty of time to feel things like that. Cyntoj worked fast, but we had a lot of walnuts.

"Stop," Mrs. G said. Cyntoj looked up in surprise. He had only readjusted about a third of them. "We'll use these until we're out. Reserve the rest." He gave Araee back her nine-in-one, the only tool she carried.

I wondered what we were going to do tonight. The same thought was on everyone's mind. Was sentry duty enough?

Cyntoj and Orso skidded over to me. "Four off, four on."

"Fine by me," I replied. Twice the sentry might double our chances.

We sat around, eating supper from packets and drinking water from canteens, our masks perched on our foreheads just in case another gas fissure let loose. Mrs. G, relaxed and quiet as usual after a meal, asked the miners about their lives. They talked about their freedom and their hard work on their claims, the kangaroo government they'd set up, and kidded each other about their tempers.

It was time. I stood up. So did Kamin. Mrs. G stood, rifle in hand. LaFarge followed her lead. We took up positions and left the other four to sleep.

I thought back about all the work we'd done since our first trip to Tyrel 3. Not even this was as bad as that trip. Since then, though, even Mrs. G had done her share of sentry duty. She took up a spot near the remaining hydros. The rest of us spread around. Among the gear we carried were night goggles.

We were all on edge, had been since Cyntoj's hydro vanished. We'd planted walnuts with the new frequency, and found it when we tested for it. It didn't cheer us. What was the problem? Araee had suggested atmospheric changes, due to gas release. I didn't buy it. Cyntoj didn't buy Mrs. G's suggestion about living creatures, either. Me, I had no idea. I thought about it while I patrolled my area. I looked at gravel, rocks, boulders, crevasses, steam, and ridges, and thought: What do I know?

From a distance, I heard Mrs. G's voice. Instinctively, I knew what she was saying: "Who's there?" Then, I heard the unmistakable sound of the interphase rifle. I tore across the gritty mud, but it gave way beneath me. I went down. I could feel the mud rolling around me. "Quicksand! Help! Hey!" I yelled.

I heard a scream somewhere else as I struggled. Then, strong hands gripped my arms—Cyntoj. Behind him, Araee's voice said, "I've got your belt—I'm levering you with this boulder—" A sudden yank, and we tumbled backward.

"Someone else is in trouble—" I staggered to my feet.

"Grab this boulder and *stay* here," Cyntoj ordered.

"Stow it. Polly yelled, too." We tore across the mud together.

The hydros looked fine, but there was no sign of Mrs. G.

"Polly. POLLY!" Cyntoj turned and yelled, "LOCATION!"

We all sounded off. Brannon. Araee. Orso. Kull. Kamin. Cyntoj.

Further off, in the distance, we heard a shot.

"Kull, Orso," I yelled as I ran, "stay with the camp stuff." I had my pistol out. I could hear Cyntoj and Araee running, too.

"Watch your step," Cyntoj reminded us unnecessarily. How could we see this crap in the dark?

"Polly!" I yelled again.

I heard LaFarge's booming voice. "Over here!"

We caught up with them at last. "What's happening, Polly?" Araee gasped.

"I heard shots," Mrs. G said.

"We both did." LaFarge sounded as if he dared us to call them liars.

No point debating. "From over here?"

"Somewhere," Mrs. G affirmed.

"What, exactly, did you hear?" Cyntoj asked.

"Well, the shriek of—bullets. The sound of a bullet hitting the dirt. If you'd ever shot old-style firearms, you'd recognize it at once."

I wasn't listening to her any more—I was straining to hear something else, at the very top of my hearing range. With these hoods and suits, it was almost impossible. My heart sank when I finally thought I heard it—a high whine. "DIAMOND!" I grabbed Araee right off the ground and tore for the largest boulder in sight. I only hoped that Cyntoj would grab Mrs. G. and Kamin would grab LaFarge.

I huddled against the boulder and thought, Please God let this be enough protection and the right direction to shield us. Araee said "What—"

Then the ground rose up and swallowed us in an explosion.

There was a great weight on the back of my head. I couldn't move it—it was mashed into the ground and there was more weight on top of that. I tried to move my hand up—no. I was buried, face down. My reflexes paid off, I thought, at least I'd pulled my mask down. Then I thought, Araee.

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I put everything into moving my right arm. I felt the soil give. At the same moment, I heard noise. An instant later, someone was helping clear me off. I struggled to sit up.

Mrs. G. let out a shaky breath and kept clearing me off.

An incredible stench hit me when I pulled off my mask. "Araee—" I croaked.

"Right here," Cyntoj said, still digging near me. I heard the sound of him hauling her out of the mud. "Orso, give me the respirator out of the med kit."

"Right."

I heard sounds of air, a pause—then choking and gagging. "I'm all right," Araee gagged.

Kamin spoke to me in wonder. "When you yelled 'Diamond' I thought you couldn't be serious, that only happened in war stories. But I jumped for cover anyway."

"Congratulations." I struggled to my feet. "That kind of thinking will keep you alive."

"What is 'Diamond'?" asked Mrs. G.

"Footsoldier warning. Diamonds are anti-personnel mines. Used to have little diamond designs on 'em, so we naturally called 'em diamond mines. They're placed by being shot from warships into planetary soil. The spaceship gunners do it, to make a planet uninhabitable for grunts. When you said you heard things rushing through the air and hitting the ground, I thought of them at once. I've been on the receiving end a few times, but I'll bet it's a new experience for you, Cyntoj."

"Once is enough."

"Who the hell is shooting at us?" LaFarge demanded incredulously.

"Damned if I know. Damned if I know why they've stopped, either."

"Are there more around, do you think?" Mrs. G. asked.

"Probably. And they've got proximity triggers, so let's get away from here pronto."

"Are there any precautions we can take?"

"Get out of here. Otherwise, no. We don't know where they'll seed next."

Araee said a bad word in Denebian.

"But we *can* set one of our frequency detectors to pick up that range of sound waves," I amended. "It's at the top level of a human hearing range."

"Mmph." Cyntoj was annoyed with himself. "I heard it and didn't realize what I was hearing."

"We were lucky we had Orso and Kull to dig us out," said Mrs. G. as we walked back to camp, "but I don't like the idea of us splitting into two camps. There are too few of us. And it certainly wasn't a mine that took Cyntoj's hydro."

As we slogged back to camp, another tremor hit. We dashed to our hydros, and heard the tent collapse in the dark.

When silence reigned again, Araee spoke in a disgusted voice. "Brannon."

"Oh, don't tell me." I pulled out my frequency sensor. Sure enough, the walnuts' frequency readings had all disappeared again.

Mrs. Gonderjhee sighed. "This is a problem. Cyntoj, can you account for the heavy silicon readings after the explosion?"

"Not yet."

"Suppose that a silicon-based life form was not as lucky as we were, back there?" Mrs. G. asked.

There was a long pause.

"You're not serious," I said.

"You noticed the change in smells, didn't you?" she asked.

"That was just the rotten soil turning over," I argued. "Of course it was stronger, but—"

"You're saying that instead of smelling silicon poop, we were smelling silicon guts." Araee put it in a nutshell.

"More or less."

Suddenly Araee gasped. "That would be why they picked on Cyntoj! Tyrellians are carbon-based, but they're left-handed energy patterns in a right-handed universe. They'd sensed others like us before, but not like him."

"Or vice versa," Mrs. G. mused. "They recognized him, but not us. It seems that the better a race knows the Tyrellians, the deeper the hatred." No argument there.

"But were they mining for us, or was someone else out to get *them*?" Kamin asked.

"Damned if I know," I said.

LaFarge spoke slowly. "If it turns out this planet's got native life on it anywhere, all our claims are worthless. We can't move in. That's interplanetary law."

"Only if they're native life," I said, "assuming they even exist." Long pause while he stared at me in the dark. "Well, how can they be, in a carbon-based world?"

"All this is pointless until morning light," said Cyntoj.

"Shit, I wish morning would come," Kamin said, "I need some sleep."

Mrs. G slid off the hydro. "Of course we need sleep. We're not sitting on hydros all night. Come help me set the tent up."

Kamin, LaFarge, and I slid off our hydros to follow her. I heard LaFarge mutter, "I think I'm in love."

I looked over Cyntoj's shoulder, squinting in the blindingly bright morning sun. He was examining oil on a boulder.

"What've you got?"

He sighed. "Of course I'm guessing. But it looks more and more like—to use Araee's phrase—we've got silicon guts here."

"It's evaporating fast in this sun." I squinted at the oil. "The rest looks like rock to me."

"It is, more or less. It might help you to think of it as a rock body with oil blood. My guess is that the sunlight is damaging to them—not as much as a diamond mine, of course—and so they move at night."

"Slow or fast?"

"I don't know. Remember, this is Mrs. G.'s theory, not mine, but I'm beginning to think she's right."

"Why haven't we heard them moving around?"

"We have. They move below ground. They move through soil as we do through air. Why not?" He carefully packed away samples. "That mine may have done us a favor. Surely we couldn't have stopped an attack by one of those creatures."

"Suppose they think we attacked them, and try to do us in tonight."

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"I think that's a likely supposition." He stood. "Breakfast. Let us see what Mrs. Gonderjhee says."

It's no understatement to say that breakfast was one of the most unpleasant meals I ever had. Why bother pushing on if the walnuts were useless, the topography changed instantly, and the natives were out to get us? Usually, at least the walnuts stayed true to us.

"We could go home," Araee said glumly.

"And report the bad news to the Miners' League? I don't think so," I replied. "Not to mention the reception K-Law will give us when we go off-world—assuming we ever manage to get enough fuel to get out of the system."

Mrs. G and Cyntoj said nothing.

Kamin wasn't any happier. "If I ain't got a claim, after fifteen years, I may as well just sit down and die. There's nothin' left." The other miners nodded sober agreement.

I was getting a bad feeling about this.

Orso leaned back and spoke carefully. "Of course, you'll always have a place with us, Mrs. Gonderjhee. Where you can stay, that won't be a problem."

"No," she stated. "Don't even bother to ask."

"Ask what?" Orso inquired innocently.

"Orso, I am a licensed surveyor. I have nothing left but my credibility. I can't sacrifice that by falsifying reports about this region. When I turn in a surveying report, it will be true and accurate." Her tone was final.

"Well, that's that, then," said Orso.

I had definite bad feelings about "that's that."

Mrs. G turned to Cyntoj. "What can we tell about these creatures?"

"It's all guesses," he said. "It could be one creature or many. In either case, it can easily move underground. It can alter or mask the frequency of the walnuts."

"The walnuts," I said. "Are they taking them just to discourage us? Or are they hearing pretty white noises, or do you suppose that's a communication frequency for them?"

He stared at me. "I don't know. But if we can pick up walnuts' frequencies through solid rock, I suppose they could."

"Is there any possibility of communicating with them?" Mrs. G asked.

"Again, I don't know."

"Shall we try for a 'first contact,' then?" asked Mrs. G. All four miners started.

"Yeah," LaFarge breathed. "If we can ask them, and they say they're not native to the planet—"

"They'll lie," Cyntoj warned. "I have never yet heard of a 'first contact' where the new race didn't swear to own everything in sight and to have been born and bred there. What you do with a first contact is try to sort out the lies from the truth, and figure out what you have in common. And I am not qualified for it. I don't have the diplomatic training. I could foul it up irreparably."

"It's already fouled up," Mrs. G pointed out. She did not say "irreparably." She wasn't stupid, either. All these miners had to do was shoot us, go back, claim we died on the job, and cover up the new life form, and it would be business as usual for them.



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"We must get some inkling of the truth. Preferably before nightfall."

Cyntoj pulled out a walnut and frowned at it thoughtfully. LaFarge asked, "How would you be able to tell if it was lying?"

"Nothing overt." Cyntoj pulled his frequency-tester out of his pack. "To take a very crude example, if it knows the concept of stars—" he motioned toward the opaque sky overhead—"we would be safe to wonder how it knew of them."

66 **D**amn." I scowled at the innards of my hydro. "Broken power-lead. Where the hell's my 9-in-1?" I felt around my bag. "Kamin, ask Araee to step over here with hers, will you?"

A moment later, Araee bent over the housing, peering in with me. "What's wrong?"

"Power-lead's snapped."

She reached inside the engine housing. I reached in to steady it. I pressed a metal button in her hand. On Araee's masked face, a change of expression wasn't very visible. I murmured, "You squeeze that, I'll come running. Receiver's in my ear."

We spliced the lead while she muttered, "Do you think I'll need to?"

"Fraid so. Hang on—a little to the left—Got it." Kamin was back in hearing range. "Thanks, chickie."

"My pleasure, Brannon. Now come help me put all these walnuts back to their original settings. Come on, Kamin," she chirped up at the miner, "you too. If I can teach John Brannon how to recalibrate sensors, I can teach anybody."

"Deal," said Kamin with a grin.

Man, we were a goosey bunch. At least I was. The silicon creatures had upset my equilibrium, and the miners were finishing me off. The only privacy we had was when one of us ducked out of sight behind one of these big boulders to relieve ourselves, and I think we were timing each other's trips on that, too. Anyway, that was how I found the stray walnut, on a comfort break.

My first thought was that Araee had dropped one. But no, that little Denebian had a math mind, and she'd been satisfied with her numbers. It had to be one of the ones we'd planted, sifted through miles of Pangaeian soil like the hydro. Why had it popped up here?

I bent down to pick it up. That was the move that saved me. A shot struck the boulder above my head. Two things happened at once. My reflexes kicked in—I dropped and rolled. I would have fired, too, if the boulder I'd been near hadn't suddenly moved. A great black thing rushed past me at freight-cruiser speed, and I saw black stone claws. I heard Orso scream. I heard the ripping sound that only flesh makes. I heard a dreadful sound like a rock plowing through gravel.

I got to my feet. The walnut was gone. The boulder was gone. I stared at the body.

"Hold it," said a voice with a gun. You don't have to be looking to see a voice with a gun. I dropped my pistol, raised my hands, and turned to see Kamin. He kept his pistol aimed at me while he studied Orso's body. "Christ. What did you hit him with?"

"I didn't. They did."

"That's bullshit and you know it. Moving rocks. Just some claimjumper trick that Tyrellian's here to pull. You guys are being played for suckers, don't you realize that? They tried to take over the ConFed, and since that didn't work, they're taking it planet by planet."

"I'd believe that about any Tyrellian except Cyntoj." I kept my voice steady. "Cyntoj was one of the casualties. He stayed loyal to the Fleet and lost everything."

"He's a Tyrellian," Kamin repeated.

"And a team member on this job, same as you," I challenged. "What's your point?"

"The point is, if this job goes through, we're ruined. I'm really sorry about this," Kamin said, raising his pistol for a better aim at me—

BLAM.

"I think the wrong one of us is wearing the receiver, Brannon," said a familiar little iron chirp.

When Araee and I got back to the campsite, the others were all gathered around Cyntoj and the transceiver he had built. LaFarge turned. "Kamin went looking for you."

"He found me just after Orso did," I growled, "and Araee found him. You want to take a shot at me, too, and get it out of your system?"

Kull lurched forward. "You sayin' Orso tried to nail you?"

"I am." I was ready for another scrap.

All Kull did was turn to LaFarge. "That claim-jumpin' s.o.b. You were right all along, LaFarge."

"I'm surprised about Kamin, though." LaFarge was calm. "Wasn't the type."

"That was a misunderstanding. I said I found a walnut, and he thought I was planting fakes. He thought we were all part of a conspiracy with Cyntoj to turn this planet over to the Tyrellian Empire." Even Cyntoj stopped working to stare at me. I glared back. "He thought Cyntoj has a hidden agenda. I can't imagine that. He's just a poor little Tyrellian trying to stay out of trouble, like the rest of us."

"You've got us wrong, Brannon," said LaFarge. "We ain't aiming to tear up this survey party. Kull 'n' I said we'd stick, so we'll stick. Y'all damn well better come through."

"Brannon," said Cyntoj quietly. He had returned to his work. "You said a walnut appeared."

"Yeah." I stepped over to him. "And a big rock that Orso shot at. The rock shot back and disappeared into the soil."

Just then, the transceiver spoke, in Cyntoj's voice. "*Request. Go.*" I jumped.

His smile flashed at the look on my face. "It was the handiest voice for me to program in. They're slow, about a three-minute response time." He looked back at his gadget. "Talk," said Cyntoj. "Number you all."

"He's been through the basics with 'em," LaFarge informed me in an undertone. "It's more than one creature, they can count, they can't see, they think slow, but they've got good

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reflexes." I remembered the rock that hit Orso, and found no fault with that analysis.

"*Number us all above.*" Beats me, I thought.

Cyntoj understood. "Number you all the stars."

"*Yes. Yes. Stars.*"

Kull and LaFarge did little victory jigs.

"Have they seen other miners?" Mrs. G prompted quietly.

"You find else like us?"

Again, a long pause. "*Many the others. You one like the rock under.*"

We were all scrambling to decode that one. "Like the rock under," Mrs. G. murmured.

"Like bedrock," I contributed.

"Old! Ancient." Mrs. G assembled it. "Cyntoj, you are one of the ancient ones."

"Many others. I alone come from the elders."

"*Yes. Yes. Elders pain.*"

"Never elders here," he told them. "Promise."

"*Pleasure pleasure.*" We agreed on that, for sure.

"We talk with walnuts. Where walnuts? Up, down, north, south, east, west?"

"*Down. Home. Pleasure. Always.*"

"They like the sound," said Araee, grimacing. "Their own pets. They took them home."

"*Put where start. Pleasure-pleasure.*"

"Not all. Fifty."

"Three hundred," Cyntoj countered.

"*Sound pleasure you.*"

"They want to know why," Cyntoj muttered. "Yes. Help us learn you."

"*No. You stay like up others.*"

"I don't understand."

"*Up others make pain. Walnuts stay you stay like up others.*"

"No. Walnuts stay, we leave."

"*You leave others come.*"

"Yes, talk to you. Then leave. Not stay."

"*Up others stay. Pain. You leave up others leave walnuts stay.*"

"Who are the 'up others'?" I asked.

"Apparently," Mrs. G mused, "some people further inland. I wonder if there are mountains?"

"That would explain 'up,'" I agreed.

"So what're they saying?" LaFarge demanded. "There are human squatters on Pangaea, in some mountains?"

"Sounds it," I agreed. "And I'm in just the mood to kick 'em off. How about you?"

"You bet," LaFarge growled.

Mrs. Gonderjhee decided. "If it's the only way they'll leave the walnuts in place, we must go and look at these 'up others.' We have no choice. Certainly we need to map mountains safe for human habitation, if they exist. Tell them what little you can of our plans, Cyntoj. Then we may as well move out."

Once again, we were a going concern. But where were we going?

We didn't know what the hell to expect at nightfall. Which was good, because we didn't know what the hell we got.

Cyntoj, Kull, and I were trying to sleep in the dark tent. We had our masks on, so sifting gas in the night wouldn't kill us. We were all goosey, though, expecting something far worse than gas.

Cyntoj did something he rarely did: challenged one of my decisions. "Why did you put the girls on together for the early shift?"

"Who wants to know?"

"Sorry."

"Because I figured all hell would break loose later in the evening." I answered his question anyway.

"Thanks a lot," said Kull. "Anyway, they've got LaFarge."

"That's what I thought. He does all right, for such a little guy."

"Yep. When he grows up, he's going to be dangerous."

"Grows up?" Cyntoj didn't get it.

"It's a joke, Cyntoj. Sometimes you don't—"

BLAM.

The earth rose up and hit us. The tent fell down. The lamps disappeared. All the hair on my body rose on end.

We scrambled out of the mess of the tent. "God," I said, "that was an interphase cannon! If we don't—"

BLAM.

We were all knocked to the ground.

"Oh, God," Kull choked, "where are they?"

"If we're still alive it wasn't anywhere near close enough to kill us." I staggered to my feet. "LOCATION!"

I listened for responses. Kull. Cyntoj. Brannon, of course. LaFarge loomed into the lamplight, with Araee staggering behind him.

No answer from Mrs. G.

"Polly," Cyntoj breathed, and disappeared from view.

It was too late to stop him, so I just called, "About two o'clock from your direction, I think." I turned to the others. "Get your lamps—"

BLAM.

When the hair on my body settled, I hauled myself to my feet. "Thank God they're lousy shots, but there must be a hole the size of the Grand Canyon out there. Get your lamps. We've got



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to split up and find Polly.”

“We’ve got to take cover!” Kull said urgently.

“Take cover where? If they were aiming for us, there’s no hope for us. An interphase cannon doesn’t leave dust. There’s no place to hide. We may as well look for Polly and hope for the best. LaFarge, try—”

BLAM.

We picked ourselves up off the ground. “Try the area where you saw her last. Araee, same for you. Give yourselves only five minutes out and five minutes back, so we don’t end up looking for you, too.”

We fanned out. Every once in a while, I heard someone call her name, but there was no response. She was either unconscious or not present. I heard Cyntoj’s voice, and thought, I’ve never heard him sound like that. He’s getting desperate.

We made six cycles in and out, trying to cover the ground as much as possible, when I called a halt. “Cyntoj, get on the horn to your silicon buddies and see if there’s any around.”

“Right.” He pulled out his transmitter and turned it on.

It spoke before he could. “—*you creatures hear?*”

“I hear,” said Cyntoj.

“*Talk and talk and talk,*” it scolded. “*One down. Come and show.*”

“Yes, yes,” Cyntoj replied.

The ground suddenly opened up in front of us. A boulder rose out of it. That was all it looked like, a boulder about two meters high and a meter thick. If there were limbs or openings, I couldn’t see them in this weak lamplight.

The transmitter said, “*Us pain. You pain also. Up others pain us. Up others pain you.*”

“Where is the one?” Cyntoj asked.

“*Come.*” It slid laterally, as if it were skating through the camp. I could hear a gravel-against-stone kind of sound. Cyntoj, Araee, and I followed it in the general direction of the shooting.

It led us straight to Polly Gonderjhee. Cyntoj practically leapt for her. “Dammit,” I said, “don’t lift her up until Araee checks for broken bones.”

“Dammit, I won’t,” he snarled. “How stupid do I look?”

“Get a grip on yourself and get your butt out of the way,” I snarled back.

Araee ignored us both. “She’ll be all right. No broken bones. Not even concussion. I don’t know what knocked her out, but she ought to be conscious soon.”

“Now you can lift her up,” I said.

He carried her back to camp. Our guide had disappeared as soon as we found her. The miners had put the tent back up. We took her inside.

Her face was covered with dirt. Araee moved to wash it, but Mrs. G’s head rocked and she woke up.

“Don’t. You are safe.” Cyntoj reached for her.

“I’ll be all right.” But she winced, and didn’t sit up. She looked around painfully. “My rifle.”

“I’ll find it.” Cyntoj rose and left.

“Araee—some water, please. My canteen’s outside.”

Araee nodded and left.

I got a good look at Mrs. Gonderjhee’s eyes, and dawn struck me. Araee couldn’t figure out why she was hurting so, and why she was still unconscious, but I could. “You faker.”

She spoke in a very low voice. “While Cyntoj is distracted, talking to me, you must search his gear, Mr. Brannon. You are looking for transmitting devices, recording devices, anything with a frequency that might allow those cannons to zero in on us. Take whatever it is and bury it. We won’t speak again.” She lay back down and closed her eyes.

Araee popped back in with the water. Cyntoj returned a moment later, rifle in hand, to sit beside her. I had a million questions I wanted to ask, and no opportunity. So I did what I do best: I obeyed orders. Cyntoj’s gear was outside with everyone else’s. I checked everything that occurred to me, but found nothing that shouldn’t be there. Of course, it could have been one of the walnuts, and I wouldn’t know. And Tyrellians were master sneaks, as the recent near-overthrow of the Confed government proved. Tradya Sedek had gone through the entire Academy program, got herself on the flagship, and almost carried the entire Fleet off to the Empress. And here I was, trying to recall old Security ideas, trying to catch a Tyrellian at the game they knew best.

On the other hand, maybe there really wasn’t anything, and Mrs. G. was just hedging her bets. That was what I really wanted to believe.

The terrain didn’t get any easier. Kull and LaFarge had insisted on towing the unused hydro, packing out what they packed in. Hydros were expensive. And, despite our truce with the life-forms, the geology didn’t get any friendlier. Once we hauled Kull and two hydros out of a crevasse. More than once, geysers sprang up practically underneath us, and sudden gas attacks still gave us rude surprises. Once we spent a night without sleep, cruising over mud flats as treacherous as quicksand.

The nights were the worst. Shots lit up the sky like lightning. We were spattered with mud and filth at times, and the tent fell down twice more. To look at it, you wouldn’t know it had been designed for earthquake conditions. The cannons were enough to make even Polly’s hair stand on end at times, but for the life of us, we couldn’t figure out what they were shooting at. If it was us, they were lousy shots. If it was the silicon creatures, they weren’t doing much damage. If they were trying to get the silicon creatures to turn on us, it wasn’t working. Everywhere we went, we talked to them, promoting the truce.

We still kept planting walnuts. Some stayed, some vanished. We hoped that Sam could get a few readings now, and that perhaps more would be possible later.

Not all the creatures agreed on the truce, plainly. There were quakes and spurts that had to be the work of a living creature. Whatever their communication system allowed, it sure didn’t result in a unanimous vote.

It took us ten days to reach the sheer wall of a plateau. Even with the occasional runs for cover, we were farther than anyone else had ever made it on Pangaea—a good fifteen hundred kilometers in. It seemed as though the shots were all going over

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our heads now. We felt safe enough to call it a night. The next morning, we calculated the height, and figured out how to bundle our hydros together in groups to scale a four-hundred-meter-high wall.

Cyntoj, Araee, Kull, and one riderless hydro made the ascent as one group. We were the other. I saw LaFarge taking specially good care of Mrs. Gonderjhee, and thought, oho.

When we reached the top, I couldn't believe my eyes.

"Green," Araee breathed. There was no other word to describe everything around us. Moss underneath our feet, and in front of us—a forest of giant ferns. It was relatively cool—slightly warmer than room temperature. After so many weeks of desolation, it was like coming into a fairy land.

"Careful," warned Mrs. G. "As I recall, fern forests also housed dinosaurs."

Somewhere in the distance, I heard a roar. It sounded both alien and familiar. The miners jumped. "What the hell was that?" LaFarge gulped. "Animal life?"

"I dunno," I said slowly. "I'm not too familiar with dinosaurs, but I think I know that one. It's big enough and strong enough, but usually..."

Cyntoj was listening carefully, too. "Usually it comes equipped with a fuelcharger engine and has spaceship registration markings on it," he concurred.

"It still sounds far away." Araee tried to peer through the dense fern-forest. "We won't be able to use the hydros. Look at that tangle."

Mrs. G unslung her rifle. "We walk."

We loaded up on gear, including the ropes and grapple hooks, and left the hydros behind. The miners weren't used to jungle slogging, but we were. It was the first time we'd got out our knives this trip, to use as machetes. Cyntoj, Araee, and I took turns at the lead. Every kilometer, we planted a walnut. Sam would wonder what the hell happened during the last thousand meters. We didn't hear the dinosaurs roar again.

We walked all day. We camped that night. We never saw a sign of any animal life. That was strange, seeing how well the plant life had developed. There ought to be at least a few insects. Nothing. Not that I'm complaining. The air was sweet and musty, but it was hellishly still. After four days of that, I was ready for the mud flats again.

We trudged on through the fern jungle. Hacking away at it had become so automatic that, when I came up against the stone wall, I just stopped. The others joined me. We looked up, up, up—at a sheer wall.

No. I could see a big hole. And, there were pockmarks in the wall, big enough for handholds and footholds. I turned to Cyntoj. "You want it?"

He sighed. "I suppose so."

"I want it," said Araee. Cyntoj and I just stared.

Mrs. Gonderjhee never wasted decision time. "Be careful. Just get a hook embedded, and sit tight until we join you." Never a word about falling a few hundred meters.

Araee's eyes glowed like a night at the prom. This kind of excitement was her weakness. Mrs. G had been right in warning her not to take chances. We watched her work her way up the



"I've been waiting for you!"

You have this fantasy, I know. You'd like to escape the mundane world of regimented work weeks, pre packaged vacations, overbearing in-laws and government restrictions. You dream of distant worlds of high adventure where naked women satisfy your every desire. Come to my world. I'll make your fantasy real!"

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Absolute Magnitude

wall, grappling hook slung over her shoulder on a rope. It was at least an hour, and how we sweated it! At last, she popped out of sight. Cyntoj yanked on the rope. It was secure. I jettisoned everything I hoped I wouldn't need topside, and followed her up, my pack still nearly full. I heard LaFarge panting behind me. Then Mrs. G, Kull, and Cyntoj.

Araee's eyes were shining. She gestured backward. "Look at this!"

We had a right to stare. There were other holes—windows—too. There was mummified grass—hay—and stalls. We were in a barn. "Good heavens," said Mrs. Gonderjhee, "this is the lower level of a city. It must have been abandoned for centuries!"

Just then, the floor shook. A tremendous roar filled the air. At close range, it was a sound I knew well: the sound of a spaceship engine being tested. After the roar, Cyntoj contradicted, "Abandoned once. But not now."

We found the barn doors. The latches and hinges, of course, were on the other side; cattle don't need to let themselves out. A good dose of pistol-shot remedied that situation. The doors flopped outward—into a large open pit.

Mrs. G examined the bottom of the pit with her lantern. "Hm. Spikes."

Cyntoj looked up and down the outer stone corridor thoughtfully. He swung a grappling hook, pitching it toward a decorative shield further down the corridor. It caught. He yanked. The trapdoor snapped shut. He shrugged. "They must have got in here to do chores safely, somehow."

Cautiously, we continued up the corridors. There were ancient, abandoned storefronts, the remains of houses, a true city. In some of the houses, we saw brown bones.

We walked on cavernous streets, working ever upward. At last we reached a level where we could see artificial light coming from underneath old wooden double-doors. Gently, Cyntoj and I unbarred the doors and opened them, ever-so-slightly.

An alarm went off. INTRUDER ALERT. INTRUDER ALERT. A voice said, "What the hell—"

I jumped back. The rest of the gang had already scrambled into nearby buildings. Cyntoj grabbed my arm to stop me. Security forces tumbled through the open door, and surrounded us. They were familiar, all right. They wore the uniforms of the ConFed Fleet, our old alma mater.

They held us until an officer came. I stared at this kid. He looked hardly twenty-five, a blond. He wore an Engineering badge and the bars of a First Officer, an unheard-of combination. Engineers stuck to their engines. When Cyntoj saw him, he smiled a genuine smile. "Of all people. Kenny Gallagher."

The young officer broke into a delighted grin, and pumped his hand as if he was greeting a long-lost relative. "Captain Smantek! You're alive! I thought the Tyrellians had finished you off. Welcome home!—such as it is."

"Thank you, Kenny. It is good to see you." Cyntoj looked around. I realized that Mrs. Gonderjhee and the others had filtered back to join us, looking stunned. "These are my friends. We'd heard rumors that someone was here. The local residents asked us to chase you off."

"The local residents—" Gallagher stared. Then he looked at us. "I didn't think there *were* any local residents."

"There are, and we just made first contact. Let's get comfortable and meet your Captain. We'll tell you about it."

The way Captain Klystrom greeted Cyntoj told even more about their high regard for him. Neither he nor his first officer questioned any of Cyntoj's statements. They didn't look surprised at our appearance. They didn't even frisk us for weapons. It was plain that, from Cyntoj, they always expected the extraordinary. Captain Klystrom personally escorted Cyntoj aboard the *Vladimir*, which perched on the very top level of the city where it had crash-landed. Gallagher, an easy host, took us to one of the ancient houses, which they had cleaned out and made inhabitable. He treated us all to ship's coffee and tea, and chatted away with us while Cyntoj and the captain talked.

Kenny Gallagher shook his head. "And I made so dam-sure I didn't get life readings before we crashed here. Silicon life-forms. Here we've been, pitching engine debris off the mountaintop, and using the distant hills for gunnery practice, for four months now. You're right, it's beyond us to fix—it'll need the diplomatic corps. We'll report it when we get spaceside, and see that proper diplomatic relations are established. If they're no more native to Pangaea than the miners are to the other continents, there shouldn't be a problem. That is amazing. Hundreds of them, down in that cesspool!"

"What are you doing here?"

"Took a shot through the starboard engine." Gallagher winced. "Lost a quarter of our crew in sixty seconds. Sliced like cheese. Of course," he added soberly, "that's what interphase cannons are designed for."

"Interphase cannon is standard equipment on a *Fleet* heavy cruiser," I objected.

"Yeah, I know." Gallagher clamped his jaw. "You don't think all the Tyrel-backed rebels gave up when Tradya Sedek got the axe, do you? Anyway, we ducked under here for cloud cover, and it was a happy chance that this mountain-peak was visible."

Gears were turning inside every surveyor's head. "If you don't mind me asking," I said, "you're kinda young for a first mate. And a chief engineer to boot."

Again, Gallagher smiled grimly. "I *am* young for a first mate. I'm one of the 'bad men and blue.'" We all stared. Every sentient being knew of Sims-McPherson's team of young loyalists. "I was in the Academy class that graduated Tradya Sedek and put her on the *Endeavour*, where she and her cohorts tried to kill off Admiral Harry Jackson and his crew."

Mrs. Gonderjhee hadn't spoken a word since we came inside the gates. Now she stirred. "You were one of Cyntoj's last students."

"Yes, ma'am. He put us on the *Rundgren*, Captain Sims-McPherson's ship, and kept us in the background. He and Jackson went back on the *Endeavour*. At the worst of it, there we were, backing them up. Since then, we've been split up, to seed other ships and make damn sure everyone stays loyal and

Deep Walnuts

active. That's what we're doing now. Mop-up. With at least nine rebel ships in this region, we don't dare get on radio and announce we've lost a wing. In another week or two, we'll be spaceworthy again. We'll go out and pick up where we left off."

"Well," said LaFarge, "that's fine, but it ain't going to help us any. The first month is over, and this is only a two-month project. We've gotta move on, and get these survey results back to the Miners' League. Otherwise, we've lost our chance of getting in the ConFed Council for another ten years."

Gallagher shook his head. "We can't let you blow our cover. I'm sure Captain Smantek can explain that to you." When he saw us all turn to Mrs. Gonderjhee, the look on his face changed. "Oh. Captain Smantek isn't in charge of this venture."

"If it's just a question of not blowing your cover, I'm sure we can adjust the survey reports." LaFarge cast an appealing glance at Mrs. G.

She remained unsmiling. "My report naturally wouldn't show a spaceship up here, but it would show ruins of an ancient civilization. Others might draw their own conclusions."

Gallagher shook his head. "We've got to maintain our cover. I imagine the Captain will keep you with us. With a quarter of our crew gone, we've got the space. You're ConFed citizens, and entitled to a free ride."

"I'm not," LaFarge yelled, "and I don't want a free ride!"

Mrs. G reached over and patted his hand. Surprised, he turned to look at her. "Sit tight, Mr. LaFarge. We shall see." She turned to the engineer. "I am curious. I've heard the name Sedek before."

"I hope you have. Once they had Tradya Sedek in custody—and it was a tough battle, she was top of our class—it was Cyntoj Smantek who went back to Tyrel 3. Tradya was only obeying the Empress, you know. There was a lot of Tyrellian glory in turning the entire ConFed Fleet over to the Empress. The Captain's job was to convince the Empress to let go of Tradya so she could be tried for treason. Once the Empress realized that Tradya had lost, she backed the ConFed, ditched Tradya, and executed half the Sedek clan for treason to the Tyrellian Empire. They're a blood-thirsty lot. I often wonder if there are any more Sedeks out there, waiting to get back at the Captain."

"I can answer that. They got him excommunicated, or whatever," I said, "and he returned the favor by blotting them out to the last man. We know. We were there."

My head was still ringing when I settled down for the night in the makeshift guesthouse. The argument had been loud and violent. Kull and LaFarge had insisted on release. The Captain and Cyntoj were adamant that we stay, and not endanger the mission. It ended up with Klystrom hauling both LaFarge and Kull away to the ship's brig. What bothered me most was that Mrs. Gonderjhee didn't say a word. She let the battle rage around her. When they had all screamed themselves hoarse, she spoke. "All right, Captain. We shall stay here. Do you feel it necessary to take our weapons?"

"Yes," Klystrom said. "It is standard procedure, especially when feelings run high. I know this means a financial loss to you, Mrs. Gonderjhee, but we can't take the risk."

Financial loss, hell. It was the end of the world. Even if they fixed their ship within the next week, even if they let us start back, we couldn't get to Sam within the two-month limit. The Miners' League would assume we were dead, the walnuts were gone, the contract scrapped, and Amlaki 5 unable to apply in this round of Council applicants. We were done for. No fuel, no ship, no Sam, no reputation. That was why I couldn't sleep.

For two days we hung around. I found Mrs. Gonderjhee sitting on a stone bench, reading. "I had more to do when I was in prison," I complained.

"Why don't you go help them with repairs?" she asked reasonably. "The sooner the ship is repaired, the sooner we can be on our way."

"Because if I have to deal with Cyntoj, there *will* be a fight," I growled. She looked surprised. "I smelled a rat 'way back when he was talking about how far away he wanted to stay from the fighting. With his reputation? I'm a real sucker."

She smiled—a genuine Polly Gonderjhee smile. "That's very noble of you, Mr. Brannon, but I do see Cyntoj's point of view. His children are all he has left—these children, his last Academy class, the loyalists who were responsible for keeping the ConFed Fleet together. No wonder he wants to make sure all his chicks are well." She leaned back with her book. "Once he makes sure they are safe, we shall renegotiate."

I nodded, and started walking away from her. Then it hit me: *We shall renegotiate.* Polly Gonderjhee and Sam Byner had one rock-solid CJS motto: Never renegotiate. I turned and looked back at her. She was looking at me, not the book. I saw a hard look in her clear grey eyes that took twenty kilograms off my shoulders. I smiled. "Maybe you're right, Mrs. G. I'll go help them patch."

So I helped. Cyntoj was glad to see me. He was getting them spaceworthy. I could see how well he fit in here, instructing, assisting, consulting. Cyntoj had come home.

I saw Araee around and about, but we didn't talk much. From the looks she gave me, she was waiting for her cue, too.

I knew it was the last day as I worked on the engine housing. The *Vladimir* was ready to roll. I knew exactly how long it would take the housing materials to set, how long for the testing to conclude, how long to load up and get moving. That night, I slid into the girls' room at the guesthouse. No one was there except Araee and Mrs. G. They sat up immediately, dressed.

I whispered, "If we want to get loose, now's the time."

One sharp nod from Mrs. G. Araee sidled closer.

"One of us has to get to their radio room and signal Sam to land at the far edge of the fern forest. He can home in on those high-altitude walnuts. We've got to get our gear back—and our weapons. We've got to get LaFarge and Kull loose. And fuel—we've got to steal one of their fuelchargers, or we can't get back to the Miners' League or out of the system. It's a tall order

Absolute Magnitude

for three of us to fill, but—" What stopped me was Mrs. G touching her fingers to my lips.

"Four," she said softly.

I shook my head. "Cyntoj—"

"Did not discuss termination with me."

I eyed her. "You going to discuss it?"

Araee whispered, "This entire complex is riddled with stone ventilation shafts. I'm small enough. The most equipment I'd need is my 9-in-1. I can make it to the radio room in the old stone manse. Then I'll get back to the cowbarn."

We needed Sam badly. "Go," said Mrs. G, and added, "Be careful."

Araee nodded. I boosted her to the nearest stone grille. Deftly, she made her 9-in-1 into a prybar. I helped her inside, then set the grille back in place.

Weapons would be a problem. Mrs. G read my thoughts. "One pistol. It needn't even work." She reached for her rope. I remembered a pistol shell at the bottom of the ship's toolkit.

This time of night, there wasn't much action anywhere. Mrs. G and I slipped back to the repairs bay and got the old pistol from the bottom of the box. I was pretty sure it was dead, but I left the safety on anyway. She took it.

We slid past two half-asleep sentries at the *Vladimir's* open hatch, and on board. We could hear occasional noises and voices, but I knew where I was going: the officers' bunkroom. We slid inside the darkened room. The commander had his own stateroom. There would be only one bunk in here with a captain's bars on the exterior.

Mrs. G shifted the pistol to her left hand, the cord looped over her left arm. She slipped behind the bunkhead as I tapped once, lightly, on the buzzer. I heard the seal give. Even in atmosphere, an old spaceman's habits are hard to break. The lid slid open. Cyntoj, half-dressed, sat up and looked at me puzzledly. Polly Gonderjhee stood, reached forward, and clamped his mouth with her right hand, drawing him against her body.

Sheer astonishment held him in place. From the corner of his eye he saw the pistol, and kept his hands at his sides. Her entire argument was silent. She kept his mouth firmly clamped, and let him see the pistol—safety on—the rope, our faces. There would be no discussion.

Cyntoj closed his eyes. He was breathing her air, feeling her warmth, and reminding himself that the past was the past. When he opened his eyes again, I could see the change. I handed him his boots and jacket. Mrs. G slowly released her grip.

"Come," was all he said.

I walked into the weapons locker as if I belonged there, while Captain Klystrom's voice over the intercom authorized my visit. As Spadi handed me the weapons, I reflected that, probably even as I packed them, Cyntoj was piping a similar message to someone in Stores to tell them what extras Mrs. G

should bring to the same "chat" with the Captain, or hereby authorizing the miners' release to her custody. None would realize that it was one of Cyntoj's gadgets, employed while on his way to Engineering to steal a fuel charger.

I joined Mrs. G and the two relieved miners at the hatch. We saw Cyntoj, and halted. Kenny Gallagher was with him.

"Come on," said Gallagher to us, "you don't have much time."

We didn't question our luck. He led us out of the ship, past the sentries, into the stone city, as if it were perfectly normal. Yet Cyntoj had a fuel charger strapped to his back, and the rest of us were hauling all the gear we could carry.

At the steps to the lower hall, Gallagher turned and put out his hand. "This is as far as I go."

Cyntoj shook. "Understood. Thank you."

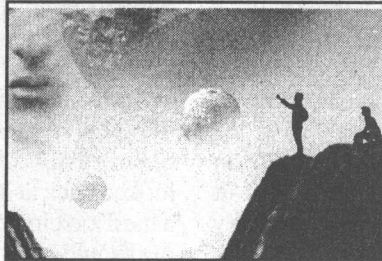
The young engineer had a strange, stern look on his face. "I'm sorry about the way it went. I'm sorry about Tradya, and the mauling you got. Now that you're finally climbing out of it, I won't see you get shafted again. I'll remind Captain Klystrom that it's still a month's trip out for you, and I'll see that we don't ever use this as a base again."

"You'll catch hell," I said to him.

"So who else wants this job?" He turned and walked away.

No guards at the barn door. They must have considered our entry there to be a one-in-a-million shot, which it was. I bypassed the alarm easily. I heard a tiny skittering noise, like mice, and hunted for a ventilator shaft. I saw dust coming, and reached up in time to catch a falling body.

Araee hugged me, covering us both with dust. She looked up at Mrs. G. "Sam's on his way. I did it!"



We were in the fern jungle the next day when we heard them take off. No one commented.

When we got to the Rustbucket, Sam was ready for us. He had already loaded the hydros. The fuelcharger made him happy. The miners filled him in while the rest of us packed and battened down the hatches. Refueled, we rose skyward, far above the sickening atmosphere of Pangaea. Then Cyntoj sent a message to the lowland walnuts: "Up others all gone forever."

Delightedly, Sam watched points of light appear all over his map. The silicon creatures kept their end of the bargain. Survey recorders rattled and sang as they recorded enough information about Pangaea to put Amlaki 5 in the ConFed Council. We dropped in at the Miners' League with full reports (in triplicate), two miners, seven hydros, and a completed contract.

Mrs. Gonderjhee went on to report and receive payment, while the rest of us got the Rustbucket—I mean, *Ridstock*—ready to go, as soon as we figured out where we were going to.

Araee had gone in with Mrs. Gonderjhee, but came back in a while, looking unhappy. I was testing the control panel, with Cyntoj nearby. "What's wrong, chickie? We lose the money?"

Deep Walnuts

"Oh, no. It's all settled. It's LaFarge. She went for a walk with him." Araee looked like she was going to cry. "He wants her to stay here with him. He was smiling at her. He gave her something. Do you think they're in love?"

I kept dogging my readouts, not looking Araee in the eye. I was careful not to notice Cyntoj, no longer working, staring too. I had often wondered if Mrs. G knew how Cyntoj felt about her. That question got answered the night she kidnapped him with a dead gun with the safety on. "Oh, I dunno. He's not a bad joe, and she could sure use a spell of good luck."

"It would foul up 'seven years of faultless virtue,'" Cyntoj observed. There was a strange tone in his voice.

"It would," I agreed. I kept my eyes on my work. "Who knows. Maybe she doesn't care any more. It must feel good, if you're a woman who's been jerked around, to talk to a hard-working man who says what he believes and never thinks of lying to you." It was a dirty dig, and I saw him turn even paler.

"You don't think she'll want to stay here, do you?" Araee chirped plaintively.

"Best way to know is to ask her." Sam had been listening in. He popped his head into the control room and indicated the front viewpanel. "Here she comes."

She looked at us all in surprise. "Are you that anxious for your money?"

"Are we going to stay here?" Araee asked.

Mrs. G blinked. "I wasn't planning to." She held a packet in her hand. "I'm surprised you left before I read this, Araee. That's not like you." She opened it up, and smiled. "A letter from Admiral Kikken. He's been in touch with K-Law, and threatened murder and mayhem. We're free to go back to Bay Station and see what's left of the office."

"Yahoo!" I caught her up in my arms and swung her around. Sam did a little jig. Araee laughed. Only Cyntoj remained silent. When we settled down, Mrs. G turned to him. "What's wrong?"

He didn't meet her eyes. He took a breath. "I am going to tell you the truth. As they say, truth hurts. The K-Law raid—was because of me."

"Did you arrange it?"

"No. I was to be the victim, killed during capture. There are still a few hidden Fleet officers who think I deserve punishment for Tradya Sedek's death. Admiral Jackson managed to order the *S.S. Big Sky* in as K-Law's Fleet support at the last minute, which knocked the plan apart. It was not the arranged backup ship. That ship was captured with a navigation plan for Amlaki 5 on its boards. So I tricked you. I wanted Amlaki 5 so badly, to go there and see what I could see. I knew I could not persuade you. It must be your own decision." He took a breath. "I expect you to fire me. You cannot allow deception among your own staff."

Mrs. Gonderjhee replied, "If you had deceived me, yes, I might be angry." She reached into her pocket and pulled out a slip of paper. It was the strip from Cyntoj's mug so long ago, reading AMLAKI FIVE.

Surprised, Araee reached into her notebook. She pulled out

a strip—her choice—also reading AMLAKI FIVE. The look on Cyntoj's face was as remarkable as Araee's.

"I took it when I passed the mug to Araee. I'm not so bad at simple sleight-of-hand. Where I grew up, every children's party had a magician."

"Why did you let me continue?"

She shrugged. "You answered my question, Where shall we go? And—I confess—I wanted to see what moved you. Like Mr. Brannon, I had my suspicions." She rolled up the scrap. "Unlike his, mine were grounded in fact."

"Yet you trusted me. Why?"

"You couldn't bear the answer to that question," Mrs. Gonderjhee replied gently.

I saw Cyntoj take in a sharp breath. "You are right. I couldn't. I—" He took another breath, and started again. "You said something earlier about inventory."

"I'll help," Sam said, leaving with him.

Araee looked up at Mrs. G. "Polly, I don't understand."

Mrs. Gonderjhee looked at me. I understood, all right. She put an arm around the little Denebian's shoulder. "Araee, how old are you?"

"Twenty-three Solar years."

"I'll tell you when you're thirty."



The Geis Letter

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Book Reviews

Reviews by Lucas Gregor

The Ballad of Kansas McGriff by Bud Webster

Aniara Press 2208 Brandonview Ave.
Richmond VA 23231.

\$5.00+ \$1.00 postage.

The Ballad of Kansas McGriff is a delightful poem by the author of the Bubba Pritcher stories from *Analog*. This signed and numbered small press offer is limited to 250 copies so I'd hurry up and order mine. Kansas McGriff is a hobo who spends his life hopping one train after another in search of travel and adventure. He ultimately hopes a train that takes him off planet and thereby becomes the most successful hobo of all times. This gave me the kind of enjoyment that Rudyard Kipling's doggerel poetry did. Call it a guilty pleasure, but find it and read it.

The Chronicles of Amber by Roger Zelazny
Audio tape read by Roger Zelazny
Sunset Productions, Inc. 1-800-829-5723

Zelazny's Amber books are some of the best fantasy books ever written. I won't spend a lot of time reviewing their content here as so much has already been written on them. I was delighted to find these. The first three *Nine Princes in Amber*, *The Guns of Avalon*, and *Sign of the Unicorn* are unabridged, the rest are abridged. Listening to Zelazny read his own prose strengthens their already impressive delivery. The unabridged books are marvelous. Unfortunately, the abridged versions are not quite as good. The abridging was done well, but the sound effects were sloppy. We hear crows inside. The sound of saddle leather creaking does not stop when the characters dismount. There are even sound effects behind a description of complete silence. Even so, these audio tapes are a must-have for any Zelazny fan.

Half Life by Hal Clement
Tor Books, 252 pages, \$23.95
ISBN 0-312-86920-7

I was pleased to see this book in print. Most of *Half Life* was serialized here in the

pages of *Absolute Magnitude*. The book opens seventy five years from now with the human race facing extinction because of the rapid evolution of diseases. A group of scientist are on Titan investigating the discovery of organic matter that can best be called prelife. There is some hope that perhaps they will find something that might help the human race's plight. The investigation is complicated by the fact that all of the crew members are terminally ill and quarantined from each other. What follows is a riveting hard science fiction novel that explores what we know about the origins of life and the evolution of disease. Clement covers new ground here, both scientifically and as a writer. He does things with characterization that I've never seen him do before and the ending is not the pat one you might expect from a hard sf novel.

A Briefer History of Time by Eric Schulman
W. H. Freeman and Co, 171 pages, \$14.95
ISBN 0-7167-3389-7

A Briefer History of Time is a hilarious romp through history and science. There's a belly laugh on almost every page. I can't recommend this book enough, it was delightful. Eric Schulman is brilliant and his take on the universe, science, politics, and religion are not to be missed.

Reviews by Joe Mayhew

Smoke and Mirrors: Short Fictions and Illusions and *Stardust* by Neil Gaiman
Avon, 339 pages, ISBN 0-380-97364-2
Avon Spike, 256 pages, \$22.00, ISBN 0-380-97728-1.

In 1993 a small press, Dream Haven Books, published *Angels & Visitations*, a collection of essays, poems and short fiction by Neil Gaiman. It was a magical box of goodies for readers who like to be surprised, to light up their mind's attic with wonders, and to listen to a powerful storyteller. It established the simple fact that Neil Gaiman, who had made the critics redefine comics writing, is also one of the most vivid and thoughtful writers in traditional prose. But small press often means small circulation, so there are too many readers

who still haven't discovered that he is one of our best writers. Which brings us to *Smoke & Mirrors*, which includes 10 of the 23 pieces in *Angels & Visitations*, as well as 21 others. "Chivalry" begins, "Mrs. Whitaker found the Holy Grail; it was under a fur coat." She is an old pensioner who occasionally bought curiosities at the local Oxfam Shop. She buys an odd silver goblet which turns out to be the Holy Grail. So, one day the doorbell rang. "It was a young man with shoulder-length hair so fair it was almost white, wearing gleaming silver armor, with a white surcoat." It was Sir Galahad, and she invited him in for tea. Gaiman juxtaposes the fantastic with the ordinary in such a way that the ordinary becomes rather fantastic itself. There is usually more going on than you'll catch in a first reading, but there is always enough to make you glad you read it and perhaps to bring you back again. The part called "An Introduction" is no mere author's preface. It includes a short story "The Wedding Present," as well as delightful background notes on each of the other 30 items, a sort of walking-tour of Gaiman's creative mind. If memory serves, *Stardust* began as a short story and has been opened out quite successfully into a novel. In this wry fairytale there is an early Victorian village called "Wall" where fairyland lies just across the meadow, behind a wall. The only door through the wall is guarded by the men of the village. It is opened once every nine years on May Day for a fair at which magical toys can be had. Tristran Thorn, a young lad from the village, promises the girl he loves to bring back a star they see fall, but it has fallen in Faerie, and his trip becomes very strange indeed. With the exception of a couple words which would annoy the edification police, this book seems like a "young adult" book. But "seems" does not stand close examination. For one thing, YA books are mostly heavy-handedly correct with attitude building social values approved by the educationalists. YA is a land of minute censorship, and the strange, complex and insidious ideas which Gaiman introduces in *Stardust* would leave the selection

Book Reviews

committee stammering. While he has appropriated some of the YA tropes, he has used them with far too much respect for his readers to please the authorities.

"At age fourteen, by a process of osmosis, of dirty jokes, whispered secrets and filthy ballads, Tristran learned of sex. When he was fifteen he hurt his arm falling from the apple tree outside Mr. Thomas Forester's house: more specifically, from the apple tree outside Miss Victoria Forester's bedroom window. To Tristan's regret, he had caught no more than a pink and tantalizing glimpse of Victoria, who was his sister's age and, without any doubt, the most beautiful girl for a hundred miles around."

Instead of Victorian precious virtue updated, sanitized and quota-laden, Gaiman gives you a rural English village with all its warts and wonders, a place on the edge of reality which strays, from time to time, over the edge. Way over the edge.

By the way, Avon has published an expanded version of Gaiman's "Never Where" (1998 6.99 pbk, ISBN 0-380-78901-9). It has a map of the London Underground and material helpful to American readers unfamiliar with British peculiarities.

The First Casualty, by Mike Moskoe
Ace, \$5.99 (pbk)
ISBN 0-441-00593-4.

In the busy, micro-detailed battle scene which fills the first 60 or so pages of this space action adventure, you meet soldiers of both sides, attractive, human and clever. There is a war between the Earth-led "Society of Humanity" and a fascist Colonial rival called "The Unify Party." The bad side has some good people and the good side has its share of monsters. Both sides seem bent on making truth the first casualty.

While Moskoe delivers his military details at joy-stick speed, he also unfolds several levels of political interaction. His most sympathetic characters are the people in the middle: miners turned marines, a merchant captain drafted into Earth's space navy, professional soldiers and underemployed college kids. His least sympathetic are corporate executives, managers, politicians, and admirals. Captains, he goes either way with.

His warfare includes "relativity bombs," gigantic rocks which are hurled down at planets at speeds which give them several

times their gravitational weight. Ice is used as armor on warships which spin rapidly to resist laser attack, and civilian miners whose technology often as not cuts the enemy off at the pass. It's vivid and reads like a movie.

Now and then he slips into a World War II mind set. He seems to know battleships and uses a lot of navy talk, but it feels more like this century than one considerably forward in time. He does an alternative-history version of the von Stauffenberg briefcase assassination attempt, and has the Unity Party's political victim's families billed for the executioner's bullet. Lots of nice history stuff. His computers sound a bit like 1997, and his infantry assaults seem a wee bit low-tech, when set against an age of starships. In many ways, Moskoe harkens back to the golden age of Heinlein in philosophy, politics, and sexual action between men and women.

His cast of characters are correctly diverse ethnic representatives, but literary affirmative action seems inescapable today. "Horatio Whitebread" is a villain, "Mattim Abeebe" is a hero. "Ray Longknife" is a good guy on the bad side. There's even a naval officer surnamed "Gandhi." Non-corrupt Admirals and other decent high officials, as in Star Trek, more often than not, turn out to be a "she." In fact there are a lot of nits to pick, if you can tear yourself away from his story, which is very well told.

This reviewer's job is to tell you about books you might like, not to pontificate or spoil. Now and then a reviewer should warn readers about frauds or over promoted turkeys. But mostly he should talk about the good books. Why give time to bad books, or pick good books to death? The problems found in *The First Casualty*, still leave it in the upper third of the action adventure genre, which is a strong recommendation.

The Avram Davidson Treasury: a Tribute Collection. Edited by Robert Silverberg and Grania Davis. Tor, 447 pages, \$27.95
ISBN 0-312-86729-8.

Avram Davidson should be as central to American short fiction as Edgar Allan Poe or any other writer now studied by university English departments. Fortunately, he isn't. You can still read him to enjoy his manic brilliance, wry horror and humor, and come-and-try-to-steal-me ideas. Most of what he had published from 1954 to 1993 were published in "pulp" SF magazines that academics would not be able

to even see; so he is still ours, and still readable just for sheer pleasure.

Well, if you missed him, for some reason, this is where you catch up, and if you didn't, this is a stash of some of your favorite stories.

In addition to the 38 stories in this collection, there are introductions and afterwards by an impressive list of SF writers such as Gene Wolfe, Ursula K. Le Guin, Michael Swanwick, Harlan Ellison, Damon Knight, Lucius Shepard, and Thomas M. Disch. So, if you were going to have a textbook, this would be it (except it would be too much fun).

Davidson wrote for people who enjoy reading. He is, often as not, leisurely and indirect, telling his story as much by landscape and portraiture as by plot. His world has overgrown paths and mellow details worth lingering in. The fantastic element in his stories is presented scenery which makes one pause and understand how bizarre, how magical the real world is.

Typically, Davidson's characters seem to wander into his stories just to be good company, showing you curious details of their everyday lives. Such is the case with his story "Full Chicken Richness." It starts out in a laid-back manner listening to Fred Hopkins conversing with eccentrics, talking about painting old houses, supply and demand, hamburgers, and trying some "chicken-type soup." It all seems like a pleasant little pastiche until, toward the end of the story, you realize he has concealed a strong, well-focused plot.

Fred discovers that the special ingredient in the "chicken-type soup" are birds being trapped by a time and space transcending machine, which brings them across into the owner's stew pot. "Inevitable! Demand exceeds supply!" says Fred as he realizes the bird was the last of the Dodos. The art of his storytelling lies in re-shaping the world with details and point-of-view until it is possible for wonders to work.

The Best of Crank! edited by Bryan Cholfin.
Tor, 320 pages, \$23.95
ISBN 0-312-86740-9.

This is an ugly duckling, rather like *Crank!*, the magazine from which these excellent stories are taken. *Crank's* remarkably lumpish covers and format made it look like one of those small university literary magazines which gather dust in college town bookstores. However, unlike those academic ego wallows, there

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were really first class stories inside *Crank!*. So, despite its cover which looks like an undergraduate art instructor's "statement," pick this anthology up (turn the dust jacket inside out) and enjoy it.

It has an impressive selection of stories: "Mood Bender" and "The Happy Prince" by Jonathan Lethem, "Food Man" by Lisa Tuttle, "Santacide" by Eliot Fintushel, "The Matter of Seggri" by Ursula K. Le Guin, "Clap If You Believe" by Robert Devereaux, "Nixon in Space" by Rob McCleary, "I, Iscariot" by Michael Bishop, "I Don't Care Who Keeps the Cows" by R. A. Lafferty, "Homage" by A. M. Dellamonica, "The Dark One: A Mythograph" by A. A. Attanasio, "The Soul Shortchangers" by David R. Bunch, "Empires of Foliage and Flower" by Gene Wolfe, "The Elizabeth Complex" by Karen Joy Fowler, "The Servant Problem" by Brian Aldiss, and "The Thief, The Princess, and the Cartesian Circle" by Gwyneth Jones. What a litany of our best writers!

To select a story more or less at random, "Clap if You Believe" is about a normal, full-sized human who falls in love with Tinkerbell, and admits to her parents that he has had sex with her.

"I've come to find so-called normal-sized women unbearably gross and disgusting."

Mr. Jones looks askance at me. "Alex, you're a most peculiar man. But then I think that's what my daughter's going to need, a peculiar man, and yet it's so damned hard to know which set of peculiarities are the right ones."

This is fantasy from a path of the mind with very few footprints on it. If anything characterizes these stories, that is it.

Reviews by John Deakins

Scent of Magic by Andre Norton
Avon Books, 361 pages, \$23.00;
ISBN 0-380-97687-0

Andre Norton is one of the best. I've been reading everything of hers, since high school, back in the late Stone Age. Ms. Norton introduces a new wizardly angle: magic entwined with odor. Norton's heroine, Willadene, is blessed with an enhanced odor sense. She can smell, not just aroma, but the spirit behind the smell. An old evil, once banished, is rising again. Its minions bear the stench of evil, undetected by most. Their tools include tainted, behavior-altering scents.

Escaping near-enslavement, Willadene becomes apprentice to the prestigious Halwice the Herbmistress. Her fate becomes entangled with that of Mahart, the duke's daughter (a particularly well-developed character). The sinister figure of Vazul, the dukes's advisor, and his unusual familiar, seems everywhere, steering the dukedom. (Norton masterfully toys with the reader.)

A super-agent, the Bat, and a masterful prince round out the final company facing the reeking, possessive evil. All are seeking the Heart-Hold flower, the antithesis of the living stench that destroys its human tools.

Unfortunately, as an aging reviewer instead of a high-school aficionado, I did notice one or two flaws. Willadene is supposed to be the ultimate possessor of scent magic, but Halwice seems to have known that and still neglected rescuing her for years. Further, the (inevitable) final confrontation is confusing. The reader may become lost; the characters seem suddenly immune to things that defeated them before. The ending is so perfectly heterosexually romantic that it is a little murky. Norton has been associated in past few years with some hard-line feminist co-authors. They may be somewhat upset by a boy-gets-girl ending.

This book is not the novel to introduce a new fan to Andre Norton, but it is another must-have for a Norton fan. She still has the touch.

Reckoning Infinity by John E. Stith
Tor Books, 383 pages, \$23.95
ISBN 0-312-86398-9

Ship sabotage disfigures Alis, a space-service officer; however, twenty-first century medicine restores normal appearance and adds improved prosthetic function. The embittered bionic woman is thrown together with Karl, the man blamed for the "accident." Part of an exploratory ship's crew at the solar system's edge, they are selected to investigate a moon-sized entity entering our system. The organic device has traveled through at least two other inhabited solar systems, as noted by the wreckage of alien probes. A human crew must explore the interior before the moonlet must be destroyed; it is on collision course with the inner system.

Alis leads an oddly mismatched team (some of whom, predictably, expire) deeper and deeper into the artifact-entity. Like microbes in a body, they explore, but in helping the entity repair ancient damage, they almost trap themselves into sharing its doom.

Stith is very good at space opera. As in *Red Shift Rendezvous*, he takes a core scientific idea and builds a story around it. Being lost inside a titanic construct-organism makes a good attention-keeping device. He pads the story with lesser technologies, and sends his characters out to test-fly the results. The package is entertaining, but his characters sometimes are unworthy of the vehicle. The female/male protagonist roles would have been stronger by switching genders. The female lead and some supporting characters have too high a cardboard content. The "evil saboteurs" conspiracy subplot goes nowhere.

Stith throws so many situational scientific projections at the reader that perhaps we can overlook the fact that some of them are flawed. He needs, for example, to research the behavior of a hydrogen gas leak in vacuum more closely.

Whatever.

Quality "hard" science fiction is difficult to write and hard to find. If your niche is near-future space action, you'll like *Reckoning Infinity*.

Legends: Short Novels by the Masters of Modern Fantasy edited by Robert Silverberg

Tor Books, 715 pages, \$27.95
ISBN 0-312-86787-5

If you are a fantasy fan—especially a fan of the widely popular fantasy series of Stephen King, Anne McCaffrey, Raymond E. Feist, Terry Goodkind, Terry Pratchett, Robert Jordan, Tad Williams, George R. R. Martin, Orson Scott Card, Ursula K. LeGuin, and Robert Silverberg—don't miss this anthology. Silverberg has put together a who's-who of the very best.

It only gets better and better. Each author includes a synopsis of his or her own series, and a map. (Without a map, it ain't fantasy!) Each short novel stands alone, beside its series, instead of inside it. Each author has trotted out his/her best, in a company of peerless peers. Each story is meant to capture new fans. If, for example, you read the collection for another McCaffrey visit to Pern, you may also find yourself drawn to Pratchett's hilarious tale of how Granny Weatherwax turned nice. You may want to check out the whole "Discworld" series. If you can't wait for another episode from Jordan's Wheel of Time series, you may be equally captured by Silverberg's Majipoor. If you buy the

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collection for one or two favorite authors, you may finish it with eleven.

There isn't a dog in the bunch. Even the B & W art captures the essence of fantasy. The strongest entries are Martin's "The Hedge Knight" and Silverberg's own "The Seventh Shrine."

If you were to teach a class on modern fantasy fiction, these are the masters whose work would form the core of the course—all in one place. If you shy away from anthologies because of unpredictably irregular content quality, put your scepticism aside and shell out for this one. If you are an SF purist who avoids fantasy, this book will cure you.

Enough superlatives: buy the book.

Hogfather by Terry Pratchett
HarperPrism, 292 pages, \$20.00
ISBN 0-06-105046-6

Pratchett has parodied so many fantasy clichés, social conventions, ethnic oddities, and cultural myths—why not Christmas? On Discworld, Hogfather's Night should bring a fat man in a red suit, delivering goodies in a sleigh pulled by gigantic hogs—but now he's missing.

Our old acquaintance, DEATH, is aware of the demise of both mortals and immortal personifications. In a fake beard, he is attempting to replace the Hogfather. Meanwhile, his granddaughter, Susan, has been reluctantly drawn into the search for the missing myth, aided by the oh-God of Hangovers. The new deity has popped into existence in the vacuum of belief left by the Hogfather's absence, along with the Sock-Eating Monster and a hair-stealing gnome who causes baldness.

Arrayed against them is a frighteningly amoral assassin, who has taken over the Tooth Fairy's child's-dream castle. The faceless, nameless beings, who once before tried to replace DEATH because of his over involvement in mortal life, have taken out a contract with the Assassin's Guild on the Hogfather's life. Everything (such as the sun coming up tomorrow) is tied to human belief in the legend. Death must deliver enough presents and bounce enough kiddies on his bony knees to keep belief alive.

Susan must follow the Hogfather back to the winter solstice blood-on-snow sacrifices of prehistoric peoples. (Pratchett can make you shiver between belly laughs.) Along the way, we'll meet the *real* Tooth Fairy, the erratic wizards of Unseen University, a sentient computer who wants a teddy bear, and a giant hog (whose uncontrolled

bladder seems to be the only thing about the new Hogfather's sleigh that children notice.)

Throw in assorted bogeymen and bad guys, apprentice tooth fairies and nasty beggars, and a restaurant serving boots as cuisine. Be prepared for DEATH to dismantle comfortable Christmas traditions with logical questions and real feelings, instead of once-a-year hypocrisy and blatant commercialism. Pratchett (bless his heart!) will make you think, as you laugh yourself through another Discworld romp.

The High House by James Stoddard
Aspect/Warner Books, 321 pages, \$8.98
ISBN 0-7394-0047-9

Stoddard may be the next C.S. Lewis. His work, page after page, unfolds the child of fantasy within every man. This is a book for boys, especially boys over twenty-one. *The High House* invokes the SF tradition of houses that are doorways to many worlds, but these worlds all lie within the house itself.

The house cannot be owned, but its latest great Master and his symbols of office are missing. The House may or may not select the heir, young Carter Anderson, as its new Master, if he can brave the terrors of its infinite hallways. There is an attic, home to the last dragon, more sage and Smaug than pal and Puff. There is an endless ocean that no living man can cross, whose waves have left only a ghost of his father to preserve a sword and mantle for his son. Carter must hunt evil, killer furniture, assisting sentient tigers, and wind the clocks of infinity with an immortal servant of the House.

Stalking his every move is the Bobby, a faceless agent of evil, and his bloodthirsty minions. He is seeking control of the House through Carter's half-brother, and manipulative step-mother. The Bobby has hidden the Master Keys, accidentally lost by Carter long ago, in a place that is utter personal terror for the new Master.

The reader will find no space devoted to romance, and will not miss it. This is a book for the adult who, as a child, never grew tired of dusty, secret stairways. Food becomes a picnic in the fantastical, overgrown wood lot behind the mysterious mansion. Life is facing your fear of the dark at the bottom of the stair and bringing back the treasure from anarchy with wounded hands, but a pure heart.

The House is always close to wonder, next door to Narnia and Oz, just a few

hallways from Faerie or Camelot. Its texture arrives from the Victorian Age, but so do Wonderland and the charge of the Light Brigade.

You're going to love this book. It is made for children like us.

The Tough Guide to Fantasyland by Dianna Wynne Jones,
DAW Books, 303 pages, \$9.98
ISBN 1-56865951-2

Here is a book without a plot, without identifiable protagonists, without a climax, denouement, or ending. Nevertheless, every fantasy fan will recognize the essence of what they read. Ms. Jones text is more dictionary than adventure, more encyclopedia than story, but it is a blast! Swivel your perspective of a fantasy series to see yourself and the characters on a Tour through a realm of fantasy. Naturally, the Tour Company provides a guidebook. Here it is, the generic guide to every fantasyland!

The author casually turns over rocks, exposing every fantasy cliché, every logical contradiction. Suddenly you're watching the same familiar game from the middle of left field. The whole book is alphabetical entries: some hilarious; some wry, some repetitive.

Ever wonder why fantasyland names always seem to have apostrophes stuck in the middle? Ever wonder why fantasy horses are so nearly indestructible, but never seem to be interested in breeding while the characters are aboard? That makes perfect sense if horses reproduce by pollination. With tongue in cheek, Ms. Jones explains why all fantasylands include a map, but why they're nearly useless. (Eventually, the characters will have to visit every bloody spot on the map, even if that's three books into the Tour.)

Every section begins with a vague "gnomic utterance," as any traditional fantasy does. You will finally understand why you never see animals in fantasyland, but you hear them. Each listing has at least one (faked) international tour symbol beside it, which are often as funny as the entry. From the minions of the Dark Lord to dwarves to desert nomads, all the familiar classes are present—and poked full of fun. The ordinary/extraordinary features of fantasy (rivers, towers, swords, markets, inns, maps, and lost heirs) all come forward and take their lumps.

Presently available only through Science Fiction Book Club, this is one fun book. Don't miss it.

Absolute Magnitude

Distraction by Bruce Sterling
Bantam Books, 439 pages, \$23.95
ISBN 0-553-10484-5

Any writer has to admire this guy. Sterling begins his story in the middle and lets it wander off by itself at the end—and gets away with it! Throughout the book, he “tells” instead of “shows”—and gets away with it! His characters spend most of the story gabbing. And, astoundingly, he gets away with that, too!

In the middle of the next century, we visit an America turned on its head. Conventional farming and manufacturing have totally collapsed. A quarter of Americans are homeless nomads, sweeping across the land recycling everything into mobile mini-factories. Children seem to be born with their fingers on a computer keyboard. Status is networked; a nomad leader fluctuates in prestige by a continual electronic vote of confidence.

Global warming is flooding every coastline, and a high-tech reincarnation of Huey Long has taken over Louisiana. A doddering President has resigned in favor of a go-getter Native American millionaire from Colorado. The United States is a second-rate power, with our currency devalued and our technology stolen and dumped into public domain by the Chinese. We are on rotten terms with our former allies, and on the brink of war with the desperate, militant Dutch.

In the muddle's middle is Oscar Valparaiso, the sharpest political manipulator who ever hoodwinked the public. A genetic oddity, rescued from a defunct clone factory, Oscar has been furloughed to a Texas science center after orchestrating a successful Senate campaign. Totally unexpectedly, he falls in love with a gifted neurologist, Dr. Greta Penninger.

To say the plot is convoluted is to admit that the Pope is Catholic. With Huey after them, the lovers and their flaky allies fend off assassinations and the total weirdness of the science of politics and the politics of science. Every evasive maneuver is a political attack; every attack is an evasive maneuver. The Senator Oscar helped elect uses one of the best solutions available: he goes nuts. Huey is embarrassed out of the picture when he commits a public murder, though he has been responsible for untold private mayhem. We win the war with the Dutch... sort of.

And, in the end, the characters hang a “Gone to Lunch” sign on the plot and just... never come back.

And you're still gonna love it. Go figure.

Newton's Cannon: Book One of The Age of Unreason by J. Gregory Keyes
Ballantine Books, 355 pages \$14.00
ISBN 1-56865-829-X

Keyes latest productions, *The Waterborn* and *Blackgod*, were praised for their fresh fantasy universe. *Newton's Cannon* also stretches toward the unique.

We follow Benjamin Franklin, Louis XIV of France, and his reluctant mistress Adrienne, with omniscient visits to minor characters. The reader is taken to a universe where Isaac Newton discovered, not the laws of classical Physics, but the mathematical laws of Alchemy. Surprise! This is *not* an alternate history novel, but another fantasy universe where equations = spells and laboratories = lairs. Okay, so we buy that. The world culture is veritably exploding with “magical” inventions, with effects that mimic technology from our century. Jacobin bad guys have taken control of an earth-crossing asteroid and plan to use it to destroy London, without considering other effects. A semi-sinister secret women's society, the Korai, have their hands in countless intrigues. S-t-r-e-t-c-h the time frame so that teenaged Franklin can still meet senile mad-scientist Newton. Rejuvenate Newton by gee-whiz formulae, so that he can appear in the sequel. Toss in psychic powers and demonic possession by angels/beings/humans who inhabit the aether.

Keyes has fallen for the trap of creating a universe where magic is open-endedly powerful, forcing himself into ever greater plot extremes. It's like a role-playing game that you began to bash a few orcs, and a few turns later, you discover yourself and your +37-Torque-Cannon toe-to-toe with the Demon Lord Queen. When *anything* becomes possible, the reader loses interest about level 15.

The author is adept at delivering characters with depth, especially in Adrienne's case. Keyes' writing itself is excellent, but he has piled too much on our plate to swallow in one helping. If eating again means sitting before the same serving until we're hungry again, it may be a while. Perhaps in the sequel Keyes will have regained control of his runaway universe, but we will have to wait and see.

The Barbed Coil by J.V. Jones
Aspect/Warner Books, 612 pages, \$22.00
ISBN 0-446-52109-4

This is Ms. Jones fourth fantasy novel, and she's getting pretty good at it, though she could be better.

In the crowded fantasy market, a writer must bring something new to the field or lose the competition. Ms. Jones new concept for the operation of magic (through manuscript illumination and patterns of pigment and shape) achieves just that. Her research and “feel” for illumination shine through everywhere. Her use of “ephemera” (magical artifacts which travel randomly between worlds) may not be unique, but it strengthens the plot.

Tessa McCamrney is drawn from our world by the power of a master scribe's illumination. His patterns interfered with her entire life, causing intense suffering from tinnitus under any patterned stress. In the world of the Barbed Coil, the same manipulation has drawn two others into the pattern. Their destiny is to free a trapped ephemera from their world, or die trying.

By far the best writing occurs when the universally omniscient point of view enters the mind of the megalomaniac king who wears the Barbed Coil. He slides in and out of intense insanity and ingenious normalcy like a blade scraping bone. His scribe/servant/victim has copied a part of the Coil's pattern that turns soldiers into demonic killers. The protagonists (naturally) stand directly in the way of his ambitions.

The second-best characters are the Queen's no-good dog Snowy and the self-tortured soldier, Camron of Thorn. The action is intense and holds the attention. However, Tessa's relationship to the complex rogue, Flavis of Burano, is thin. Obviously (from their meeting on page 20) they are going to fall in love and do the monogamy thing. Throughout the book, their relationship is more Harlequin Romance than medieval S&S fantasy. Similarly, though I love a happy ending as much as the next guy, Ms. Jones crams an awful lot of happily-ever-after into the last, short chapter.

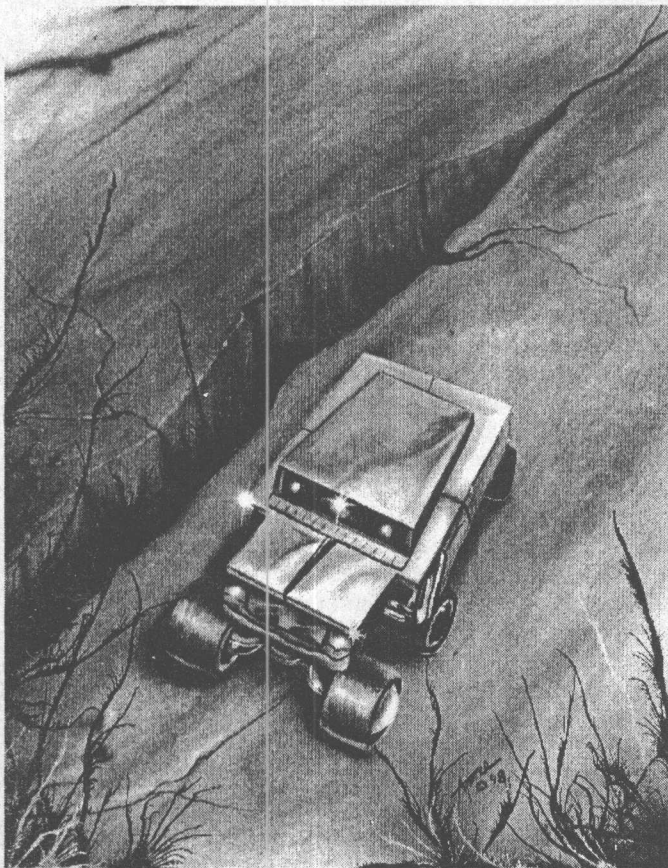
Though a trifle long, with minor aspects (such as healing from disabling wounds with a handful of herbs and a few long naps), *The Barbed Coil* is solid Swords and Sorcery—a good read.



Exchange Rate

Hal Clement

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“Emi! Nic! Hold it! Senatsu’s found a break!”

The speaker was excited, but neither driver bothered to look up. A “break” on Halfbaked meant little to human eyes; it was a spot where radar frequencies, not human vision, could get through the streaming and usually ionized clouds which kept starlight from the surface. Neither cared to look at stars. They were very worried men at the moment and didn’t even look at each other. However, Ben Cloud kept talking, and his next words did manage to get their attention.

“It’s near Hotlat plus eight and Rotlat plus eighty, close to the track they should be taking back here.”

The operators of the *Quarterback* did glance at each other this time. Facial expressions didn’t show through breathing masks. They didn’t need to. For a moment both were silent; then the younger spoke aloud.

“Has she really spotted anything definite?”

“She thinks so. She’s checking all the usable spectra now. Stand by; she should be through in a few seconds.”

Quarterback’s drivers looked wordlessly at each other once more, and Dominic hit the quick-cutout that brought the runabout to a halt. Operating any sort of surface vehicle on Halfbaked demanded full attention.

“Well?” said Emi. After all, a few seconds *had* passed.

“Stand by. She’s still at it.” A longer pause followed, until even the more patient Nic was tempted to break it, but Ben resumed before either

listener actually gave in.

“She says yes! It’s *Jellyseal*’s pattern.”

“Anything from the girls?”

“No, but *Jelly*’s moving apparently under control and at a reasonable speed.”

“What’s that? Or can Sen tell?” cut in the elder driver.

“The tanker’s doing about a hundred and eighty kilos an hour. Must be open country.”

“How’s she measuring that?”

“Tell you soon. Sen’s taking all the advantage she can of the break, but it’ll take a while to cross-check with memory. They’ll probably have to move a bit farther, too.”

“If the speed is real, they’ve probably unloaded.”

“Probably. Maria reported they’d reached what seemed to be the broadcast site and found something city-ish, though she never really described it. That was nearly twenty hours ago as you both know. That was about five hundred kilos outward of where they seem to be now. They could have emptied, loaded up again, and easily be at Sen’s current fix. You can stop worrying.”

“And the natives *did* acknowledge receipt of the shipment, and even said how delighted they were, didn’t they?” asked Dominic. “But no more word was coming from Maria and Jessi. That’s the picture we had from Tricia before we started.

“She was firm about the acknowledgment, yes. Still is. You know how she waffles when a message seems to involve abstractions, though. They were very repetitious, she says, talking about how they understood why we couldn’t send pure hydrogen and commenting again and again on the wide variety of compounds there were anyway—”

“I got all that. Paraffin, whether you’re speaking European or North American Anglic, does have a lot of different hydrogen compounds in it. I’m admitting we know the girls got there, but still wondering why we haven’t heard from them since. We’ll stop worrying—maybe—when they say something.” Emi’s tone suggested strongly that he wanted no advice as he went on, “You say they’re backtracking? Using the same route?”

“Senetsu hasn’t had a long enough look-see to tell. They’re just about on the path they took earlier, I gather, but remember we didn’t see them get to it. We did map more than half of it outbound, but I’d say—”

“We know all that!” snapped Emi. “What I want to know is whether Nic and I should keep on and try to meet them.”

“I’d say no. It made sense to head for the transmission source when they seemed to be stuck there, but now we know they’re moving and presumably heading back here, it seems smarter to wait for them here at Nest.”

“But suppose they still don’t report? How long do we wait? And what could keep them from talking to us, anyway?”

“The same sorts of things that keep us from seeing them as often as we’d like. We’re talking to you all right now, but you’re only a few hundred k’s away using multiple channel cross-link. They’re nearly fifty thousand. We can see even you only occasionally—less often than we can see them, since there are more clouds here on the dark side. You know all that as well as anyone. Halfbaked wasn’t built for long range talking. It has too many kinds of clouds, too many kinds and strengths of charge dancing around in them, too many winds high and low and up and down and sideways and circular, too much pure distance—”

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"And natives who use AM communication but still make some sense. I know all that!" snapped Icewall.

"Then please talk as though you did." Ben was getting a little short, too. "Look, I know you're worried, and I know why, even if I don't have a shared name yet. It's too bad the girls won the draw for the first load, but even you didn't try to change it so Nic could go with Maria or you with Jessi. They went. They really weren't in any more danger pushing a tanker around the landscape than at Nest, except for being farther from help if they needed it, of course. It isn't as though this idiotic world had any nice stable places where you could put up a building and go to sleep with reasonable hope the ground wouldn't pull apart under it before you woke up. I know your wives haven't talked to us since they reported spotting their city, or village, or whatever it turned out to be. That's a fact. I don't dispute it, and I can't account for it except with guesses I can't support. So go ahead and worry. I can't stop you, and I wouldn't if I could. They're your wives. I still think, though, that you'll be smarter waiting for them here than going thirty or forty thousand kilos, a lot of it in sunlight, and trying to find them while they're still moving and we can't keep good contact, visual or verbal, with either of you."

"I suppose you're right," Erni admitted in a much meeker tone. "Nic? You think we'd better go back, too?"

Dominic Wildbear Yucca—Maria might no longer be alive but he was still entitled to their jointly chosen name because of their children—nodded silently, and without further words looked carefully around through the windows ringing the cockpit. One looked before moving anywhere on Halfbaked. Neither window nor roof port was made of glass; there were too many fluorine compounds in Halfbaked's atmosphere for silicate materials to be trusted. Silicon tetrafluoride is a gas even at most Terrestrial temperatures. Satisfied that no serious landscape change had sneaked by his notice during the talk, he repowered the driving system—stopping was nearly always safer than starting, and the control system reflected that fact—and sent the runaway into a fairly tight turn. The path was wide enough to need little steering care at the moment, though bushes, rocks which had rolled from the modest hills, cracks in the surface, and patches of vegetation which might or might not be on fire could be encountered any time.

The spaceward side of Halfbaked was well covered with what looked to human beings like plant life, though its actual ecological role was still being argued. No animals had yet been seen, unless some of the large and small objects resembling fragments of burned paper which seemed to be borne on the fierce winds were actually flying instead. There was evidence on some of the plants that things were eating them, but the pool for the first confirmed animal sighting was still unclaimed after five Terrestrial months. Two schools of thought were developing among the biologists: the katabolic part of the ecology was being handled by microbes, or was being taken care of by fire.

Drivers could devote very little of their attention to specimen search while their machines were in motion. The *Quarterback* trembled slightly as it moved, partly from ground irregularities, occasionally from temblors, and mostly from winds of constantly varying violence and direction. At their present height above the reference ellipsoid—Halfbaked had no seas to provide an altitude zero—the pressure averaged about seventeen atmospheres, wavering irregularly and on a time scale of minutes by about two each way. With its molecular weight averaging well over a hundred, wind was both difficult and unsafe to ignore.

Dominic nursed the vehicle up to nearly two hundred kilometers per hour. There were few obstacles now in sight, and the red and green deep-lights flashing alternately from their masts on each side of the runaway provided shadow patterns easily interpreted as range information. It was better than computer-backed radar in the continuous howl of microwave

and longer static emitted by the local plants. The lights also allowed human-reflexive response time; glancing back and forth between the outside and a screen, no matter how precise and detailed the latter's readings might be, would have put a much lower limit on permissible driving speed much of the time.

Erni kept his hands away from the controls, but watched their surroundings as carefully as his partner. Both could see in all directions even here on night side, since a bank of floods supplemented the deep-lights and there was nearly continuous and fairly bright lightning among the clouds overhead. Halfbaked, less than eight million kilometers from the center of its G3-to-4 sun, had plenty of energy to expend on luminous, biological, and even comprehensible local phenomena.

The driver did cast an occasional glance at his younger companion. He would never have admitted that Erni could be more worried about Jessi than he himself was about Maria, but the Icewalls had been married less than three years as against the Yuccas' fourteen, and might possibly be less philosophical about the unpredictability of life.

Apparently greater worry was not hurting Erni's driving judgement, though. His "Watch it!" from the right-side station was essentially simultaneous with Nic's cutting out drive again. *Quarterback* came to a quick halt, but not a smooth one.

Active faults don't move smoothly; even on Earth they cause quakes, often violent ones. Under more than seven Earth gravities, the quakes tend to be much more frequent and no less violent. Both drivers floated quietly at their stations and watched; there was nothing else to do until what they saw made detailed sense.

The fault could be seen half a kilometer ahead, though rain was starting to fall, but there were no hills close enough to offer a threat of slides or rockfalls. If there had been, it was likely that not even trained driver reflexes could have coped with all the probabilities, and more worry would have been in order.

The ground movement was largely horizontal, they could see and feel. The fault started from some indeterminate point to their left, slanted across in front, and extended out of sight ahead and to their right. It did have a small vertical component; the far side had lifted nearly half a meter since they had passed the level site less than an hour before. Rather casually, Erni reported their stopping and the reason for it to Nest; Ben acknowledged with equal aplomb.

"Unless it gets a good deal higher, we won't have any trouble in getting past," Icewall concluded.

"If it's still shaking, maybe you ought to get by before it rises any more," was the answering suggestion. Erni glanced at his partner, nodding thoughtfully.

"You have a point. All right. We'll send out bugs to see if it's any lower within a kilo or two, and climb at the best place. We'll call you when we start. If you don't hear from us in two or three minutes after that, someone come out and collect the evidence."

"If we can spare anyone." That point also was well taken, though too obvious to all concerned to be worthy of answer. Energy was essentially limitless thanks to ubiquitous miniature fusion units, and self-reproducing pseudolife equipment was almost equally so as long as there was no shortage of raw material; but personnel on a world like Halfbaked was another matter entirely.

The servobugs guided them to a spot a few hundred meters to the right. The men called them back, powered up again and sent the runaway slowly toward the infant cliff, stopping again some two meters away. Both operators watched carefully for a minute or so. A slip of a millimeter or two every few seconds was accompanied by more shock waves. One could only guess whether an especially large jolt was waiting to be triggered by the car's weight, but the regularity of the motions themselves was encouraging. Nic retracted the dozen wheels on which

Exchange Rate

they had been traveling and let the body settle onto its caterpillar treads; then, for reasons he didn't bother to state, he motioned Emi to take over. The latter obeyed in equal silence. Even more slowly than before, *Quarterback* eased forward until the treads touched the tiny escarpment and the front of the vehicle began to lift.

The frequent small shocks became much easier to feel but no more worrisome. The men could see the front of the vehicle lifting but not feel it; up and down, even under heavy gravity, were not obvious except by sight to people floating in water—and sight needed a better reference horizon than this world with its vast size and short atmospheric scale height could provide.

Tension mounted as the mass center of the vehicle approached the edge. Both men clenched their fists and held their breaths as it passed and the machine rocked forward.

In theory, the runabout wouldn't buckle even if its entire fourteen-hundred-tonne mass—some ten thousand tonnes weight, here—were supported only at the center. Nesters, however, tended to have an engineering bias toward regarding such theory mainly as a guide for planning experiments. This sort of experiment had been done before but not, as far as either driver knew, with acceleration from seismic waves helping out the gravity.

The body did hold. The impact as it finished rocking forward and the front touched down was gentle, somewhat cushioned by a patch of half-meter-wide, viciously spined growths resembling barrel cacti. Dark red, almost black, fluid which splattered from these crusted over almost at once as the air touched it, but slightly to the men's surprise they did not ignite.

A moment later *Quarterback* was resuming speed with Emi still driving. Nic reported their new status to Nest, added encouraging details about the stresses just survived, and asked for an update on the tanker.

"Still moving, still apparently on the way back," replied Ben. "Average speed about a hundred sixty."

"Did they really slow down, or is that just a better measure?" Nic barely beat his friend to the question.

"The latter, Senatsu thinks. But they're coming, almost certainly backtracking on their original path. They're not heading straight toward Nest, but nearly Hotsouth toward the dark side. We're wondering now whether the original guess about travel being better out of the sunlight was right, or if they have some other reason. There's still no direct word from the girls."

The flotation water was clear enough to show part of Emi's frown above his breathing mask, but he said nothing. The clusters of spiky barrels were becoming more numerous, and even though he knew contact would not harm the *Quarterback* he disliked casual destruction.

The drive settled down to routine. *Quarterback* didn't have far to go by Halfbaked standards. They had barely started their trip to the "city" reported by *Jellyseal's* drivers, which was nearly fifty thousand kilometers from Nest along a geodesic and much farther by realistic standards. The topography seldom allowed a completely free choice of path, and it had seemed wise to make most of the journey out of sunlight as long as there was no obvious reason for haste. Keeping the cargo below its boiling point would be much easier, for one thing.

Now, of course, the cargo should be different.

The husbands, when voice contact had been lost, had been worried and planned to take the geodesic route rather than follow the mapped track of the *Jellyseal*, but they were still on the night side less than a thousand kilometers from Nest when they turned back.

The tremors from the shifting fault grew less intense as they moved away from it. This might be due to increasing distance or to actual quieting down of the disturbance. There was plenty of seismic equipment at Nest, and the quakes had probably been detected there; but

until a far more extensive network could be set up there would be no way to pick particular ones out of the continuous rumblings and quiverings originating throughout the huge world's crust and mantle.

Neither driver thought of blaming other Nesters for failing to warn them about the obstacle just passed. Satellite mapping through charged clouds was difficult, and anyone away from the base was on his own—or on their own; no vehicles went out with less than two crew members, and no one went out walking. Suits which would let a human being take a step in seventeen atmospheres pressure and over seven Earth gravities, even though Nest had been built in a region of human-tolerable temperature, were not available anywhere.

Techniques had been planned for transferring people from a crippled vehicle to a rescue machine, but so far these had not been tested in genuine emergencies. Also they depended on the cripple's not being too badly bent out of shape. Doors had to open...

The *Quarterback* had to slow down after an hour or so, as the rain increased. The drops were not staying on the ground, but boiling off as soon as they struck; the resulting mist, rather than the rain itself, was blocking vision. The black, blowing flakes had vanished, whether as a result of blocked vision or because they were washed to the ground could only be guessed. What was falling was anyone's guess, too; presumably fluorine compounds, but emphatically not water. Hydrogen was far scarcer on this world than on Mars or even Mercury.

Dominic made one of his thoughtful weather analyses as the rain slowed them.

"There's a high ridge back of us and to the right, remember? Surface wind seems to be toward the day side as usual, so the air is being pushed up and cooling adiabatically as it reaches the hills. Something's condensing out, maybe oxides of sulfur or fluorides of sulfur or silicon. We ought to get out of it in a few kilos."

The prediction, especially the phrase "as usual," took Emi's mind off his worries for a moment. This world's weather was quite literally chaotic; the word "climate" meant nothing.

"How much'll you bet?"

Nic glanced over at his partner, thankful that his own face was invisible. "Well-I-I—" He let his voice trail off.

"Come on. You're not going to cut off my best source of income, are you?"

"You should work for a living, but all right. Fifty says we're in clear air in—oh, twenty kilos."

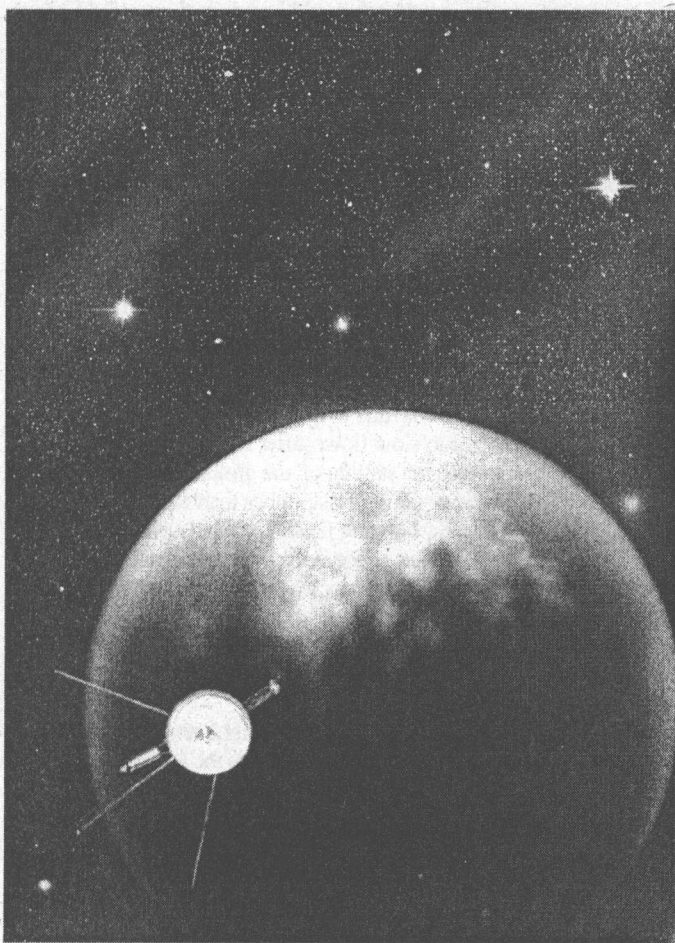
"You're on. Check the odometer." Yucca zeroed one of the wheel counters. *Quarterback* had been off the tracks since leaving the quake site. "Not that one, friend. It's center right, not a driver, off the ground a lot of the time, and you know it." Still glad that his face couldn't be seen, the prophet activated a driving-wheel meter.

Emi rather pointedly made sure it was actually counting, his divided attention almost at once giving Dominic a chance to distract him even further.

"Watch it. Boulder." The runabout swerved rather more than was really necessary, grazing an asparagus like growth three or four meters high and knocking it over before Icewall steadied. Neither looked at the other this time, but the driver did not slow down. Yucca decided that no more needed to be done for a while to stop his friend from worrying. After all, he himself couldn't help wondering why there had not been word from *Jellyseal*. Ben's explanation had been plausible, but still...

They were still in rain, though quite probably a different sort—Nic could have been partly right—an hour later. The odometer had been stopped and, after a coin had passed from Nic's possession to Emi's, rezeroed. There had been two or three more reports from Nest; the errant tank was still traveling, more or less in the expected direction, but still no word had come from its occupants.

Absolute Magnitude



"I wonder what they're bringing back," Dominic ventured after a long silence. "The natives didn't get very specific about what they could trade, though they seemed to want the hydrogen badly enough."

"According to Tricia," Erni amended. "Desire's a pretty abstract concept too, you know."

"They repeated the request enough times and enough different ways so even she was pretty sure. And you can see why scientists here want the stuff." Icewall merely nodded at the obvious.

Beings on Halfbaked at all versed in the physical sciences would presumably have detected Element One in the spectrum of their sun, looked for it on the planet, probably learning a lot of chemistry in the process, and possibly found the traces accumulated in the crust by eight billion years or so of stellar wind. The urge for enough to do macroscopic research would have matched that of the discoverers of helium and plutonium on Earth, not to mention the seekers for coronium before spectroscopic theory matured. The human explorers on Halfbaked had understood and sympathized. They had designed and grown the paraffin tanker some humorist with a background in historical trivia had named the *Jellyseal*, loaded it with high molecular weight hydrocarbons from the brown dwarf thirty-odd astronomical units out from 51 Pegasi, and sent it to the apparent source of the native transmissions. Communication was still vague, but there seemed a reasonable hope that something of use to human knowledge would come back. Attendant risks to human health and life were taken for granted and accepted.

Except, to some extent and for the time being, by the spouses of the *Jellyseal*'s drivers.

The two men drove, ate, and slept in turn. They felt their way through rain and fog—or maybe it was dust—held their breaths as they threaded narrow valleys where falling rocks could not possibly have been avoided, enjoyed an occasional glimpse of still unfamiliar constellations, speculated aloud about an occasional unusually large blowing object, felt the *Quarterback* tremble in gales which came and ceased with no apparent pattern (though Dominic still tried, usually adding to Erni's cash reserves), asked without result whether there had been word from their wives, listened to the constant exchange of messages with the natives which were slowly expanding a mutually useful scientific vocabulary, and drew steadily closer to Nest.

The word about the tanker's motions remained encouraging; it appeared to be under intelligent control. The best evidence appeared when the *Quarterback* was about an hour out from the base. It took the form of a report from Senatsu Ito Yoshihasai which was not, at first glance, encouraging.

"The girls are headed for trouble, I'm afraid," she said thoughtfully to Ben.

"How?"

"The path they took out has changed, about a hundred kilometers ahead of where they are now. What was a fairly narrow valley—a couple of kilos wide—seems to have been blocked up by something. It's filling with some sort of liquid, as well as I can interpret the images. At least, its surface is now remarkably level and higher than before, and if it were freezing I'd expect crystals to do something to the reflection somewhere along the spectrum."

"Can't they travel on it anyway?" Cloud was tying *Quarterback* into the communication link as he spoke. "The tanker should float on any liquid I can imagine at dayside temperature, and the tracks would drive it after a fashion."

"It's the 'after a fashion' part that bothers me," the observer/mapper replied. "I *think*, though I'm not at all sure, that the stuff is spilling out the darkside—Hotsouth—end of the valley; and whether it's a real liquidfall or just rapids, I'm doubtful anything human-grown can hold together in either."

"They'll see the lake or whatever it is and at least know better than to go boating," was Erni's surprisingly optimistic response.

"But what can they do if they want to take another path?" asked Dominic. "Would the maps they started with be any help? Especially the way the topography changes? Wouldn't they just wind up wandering around in a maze? I'd hate to have tried this trip without your guiding us."

"I suggest," responded Ben slowly, "that Sen recheck their general area as thoroughly and quickly as she can. Then she can work out as good an alternate path as possible, and we'll send it to the girls. They're not transmitting, but we don't know they're not receiving."

"Why didn't we call them and ask them to stop, or travel in a circle, or something like that a long time ago?" asked Erni. He carefully avoided sounding critical, since he had to include himself in the list of people who hadn't thought of this.

"Ask Pete. I'm not a psychologist," Ben replied. "Sen, what sort of topo information do you have for that area?"

"Pretty good, both current and from the original route pix. Give me a few minutes to match images and check for changes."

Even Erni remained silent until the mapper's voice resumed. She did stay within the few minutes.

"All right. Thirty kilos ahead of where they are now, they should turn thirty degrees to the right. Another ten kilos will take them into a valley narrow enough to be scary; they should wait, if they feel any tremblors, until things seem to quiet down, and then get through as fast as possible. I can't resolve the area well enough to guess how fast that would be.

Exchange Rate

Once through they can slow down if they want—there'll be no risk of rockfalls for a while. Seventy more kilos will take them past the lake, and they can slant to the left as convenient. That will bring them back to the original path sooner or later. They can check whether there's a river in it now. I'd like to know; I've seen plenty of what looked like little lakes, plus the big one at the native transmission site, but nothing that looked like flowing water—it wouldn't be water, you know what I mean—so far. Got it?"

Ben had been making a sketch map as Sen spoke. He used a polymer sheet and an electric stylus, rather than pencil and paper, since the Nest was also under seven-plus gees and its personnel had the same need of flotation as the drivers. Most of the personnel referred to their rest-and-recreation periods in the orbiting station farther out from the star as "drying-out" sessions, although much of the time in them was spent in baths. Recycling equipment is never quite perfect.

"I think so." Cloud held his product in front of the pickup—his station was more than a hundred meters from Seantsu's—for her to check.

"Close as I can put it," she agreed. "See if you can get it through to the girls."

Nic and his companion lacked the visual connection, but listened with critical interest as the word went out. Ben didn't have to include them in his transmission net, but it never occurred to him not to. Both drivers looked at each other and nodded slowly as the first message ended; the mental picture they got from it matched the one they had formed from Senatsu's words. They didn't actually stop listening as Ben set a record of his words repeating again and again to the relay/observation satellites, but most of their attention went back to the *Quarterback* as they resumed travel. They were now only an hour or so from Nest, but that was no reason to ease up on caution. They could die just as easily and completely at or inside the station's entry lock as anywhere else on the world.

Fallen rock areas. Risk-of-falling-rock regions. Puddles to be avoided—the liquid could easily be something that would freeze on wheels or in tracks if the temperature dropped a Kelvin or two. It could even be a subcooled liquid waiting to freeze on contact; such things did occur, and there was no way to tell just by looking. Stands of organisms which *could* be smashed through, but which would also produce liquid. Some of these were quite tall; Emi had never visited Earth and was not reminded of Saguaro Reserve, but most worlds with life have xerophytes. Usually the biggest growths were widely enough spaced to avoid easily, but some of the others grew in nearly solid mats.

The men had often driven over the present area, and both noticed that some fairly tall specimens seemed now to cluster along the outward path they had crushed a day or so earlier. Possibly these used the remains of other organisms as nourishment. If so, they grew *fast*.

Nothing corresponding to animal life ever showed itself, and many seriously doubted its presence; but some of the "plants" showed stumps where trunks, branches, or twigs had obviously been severed, though the detached fragments could seldom be seen. Tendrils would still be lashing, as though their owners had been disturbed by something moments before the *Quarterback* passed.

Some of the Nest personnel were beginning to suspect that the number of plantlike growths and patches within ten or fifteen kilometers of the station was increasing as the days passed, but no one had yet made a careful study of the possibility. It might be interesting, but was not yet obviously important.

Quartermaster was in a relatively open space when Ben's voice caused Emi to cut drive reflexively.

"They're turning, she thinks." The lack of nouns bothered neither driver; they didn't even bother to ask, "Which way?" They simply

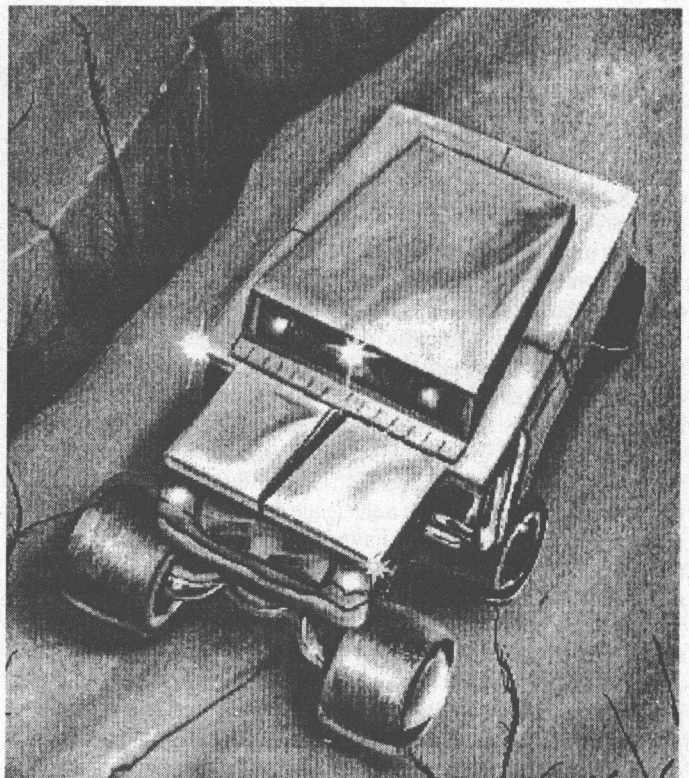
floated at their stations and listened. The oxygen monitor in *Quarterback* recorded a sharp drop in breathing rate, but not for long enough to cause it to report an emergency. Cloud would probably not have been bothered by such an alarm anyway; unlike the monitor, he was human.

Senatsu improvised quickly. The atmosphere was fairly clear around her target at the moment, and she was able to set up an interferometric tie between the tanker's reflector and a nearby bright spot—a stationary one, she hoped. This let her measure the relative motions of the two to within a few centimeters per second. It took less than half a minute to show that *Jellyseal's* direction of motion was changing, and another minute and a half established that the machine had straightened out on a new course thirty degrees to the right of the earlier one.

Coincidences do happen, but human minds tend to doubt even the real ones. For the first time in many hours, *Quarterback's* drivers really relaxed. The remaining distance back to Nest was covered calmly and happily, though neither man remembered later much of the conversation which passed. With anyone.

The reception lock had been readied for them, its water pumped into a standby tank, and the doors opened as they approached. Dominic eased the runabout inside and powered down as the door sealed. The two waited while water flowed back, pushing the local air which had entered with them out through the roof vents, and was tested. As usual, more time was needed to neutralize the sulfuric and sulfurous acids and to precipitate and filter out the fluorides formed when the air had met the liquid, but at last they could open their own outer seal, check their personal breathing kits, and swim to one of the personnel locks occupying two walls of the "garage." Emi pointedly allowed Dominic to precede him into the main part of the structure, though the latter was not entirely happy at receiving attention due to age. Fifteen years out of fifty wasn't that much of a difference, and he was the taller and stronger of the two.

Of course, it was a relief to know the youngster had stopped worrying enough to be polite.



Absolute Magnitude

Jellyseal had been about a month—more parochially, seven years—on its way to the native city, or settlement, or camp, or whatever it might be. By the end of the first day after the return of the no-longer-anxious husbands, it seemed likely that about as long would be needed for its return. Perhaps, Senatsu remarked hesitantly, a little bit less. “They’re making slightly better time right now than they did going out, but they’re still on the sun side, and will be for days yet. They can see better, after all. When they get to the real terminator we can find out how much they have to slow down. They’ll be easier for me to see in the dark, too.”

This remark was no surprise to her listeners. The tanker of course carried corner reflectors for the microwave beams from the satellites, and with less reflected sunlight, and thermal and biological emission from the planet’s surface the contrast between vehicle and surroundings would be a lot better. All this except the greater plant emission on the day side had been discovered, and much of it predicted, long before. Nic and Erni, together as usual and just returned from a test drive, simply nodded at Senatsu’s report, and went on about their routine work.

Much of this involved the preparation of the second tanker, already being called *Candlegrease*. Most of the staff were from colony worlds where conditions were still fairly primitive, and in any case human educators had had the importance of detailed history knowledge forced on them after the species began to scatter. Candles had no more disappeared from humanity’s cultural memory than had cooking—including making jelly.

It had occurred to several people that towing a paraffin tank as a trailer might involve less trouble in a number of ways, and possibly even be safer for the crew, than driving one as a tank truck. It was taken for granted that another load of hydrocarbons would go to the natives, even though no one yet knew what value the material now coming back might turn out to have. There was a natural sympathy for the needs of researchers, and at the very least whatever it was couldn’t help but supply information about the natives themselves. *Jellyseal*’s slow approach was being watched with interest by everyone, not just the waiting husbands.

Nearly all the labored communication with the native city dealt with science; most of the linguistic progress that had been made so far had come from computer correlation between human vehicle motions, which the natives seemed able to observe even at great distances, and radiation emitted and received from the observing satellites. Discussions tended to consist of comments about orbital perturbations and precessions and their connection with the planet’s internal structure. Computers at Nest were gradually building a detailed map of Halfbaked’s inner density distribution and, more slowly, a chart of its mantle currents. Not surprisingly for a planet a hundred and seventy-seven times Earth’s mass, almost five times its radius, and over seven times its surface gravity, plate tectonics was occurring at what the planetary physicists considered meteorological speed; and the plates themselves were state- or city-rather than continent-size. This made travel interesting and mapmaking an ongoing process. Since the establishment of Nest, one couple who had arrived as meteorologists had shifted over to crustal dynamics and been welcomed. They had been rather glad to make the change, though a little embarrassed at flinching from a challenge. Halfbaked’s atmosphere had a dozen major components, mainly but not only fluorides and oxides of sulfur and silicon, varying in completely chaotic fashion in relative amounts with time and location and ready to change phase with small variations in temperature, pressure, input from the sun, and each other’s concentration.

Reliance on miracles was not, of course, a useful solution to any problem; but some of the staff occasionally, and of course very privately, felt slightly tempted. After all, the supernatural could hardly be *much* less useful at prediction than the math models produced so far.

So what talk there was with the natives tended to be on the physical and material rather than emotional planes. Even mathematical abstractions, critical as they were to chemical discussion, were not progressing well. It was not even certain that the others knew—or cared—about the returning tanker.

Tricia Whirley Feather, responsible for the final steps in guessing what the computer-derived translation attempts might actually mean, was just about certain the paraffin shipment had been received and appreciated. She had no idea whatever what, if anything, was being sent back in exchange. She was not at all certain that the concept of “exchange” was clear to the natives.

But *Candlegrease* was nevertheless being grown and modified outside in the Halfbaked environment, where the more serious planning errors should show up quickly. An overpowered and overweight runabout, named *Annie* from another ancient literary source, and intended to tow the carrier, had been more or less finished. At least it was driveable and Erni and Dominic were testing it. There was little general doubt that these two would make the second trip, though Ben had some personal reservations. These were finally resolved almost by accident.

The regular planetological work of the station was kept up, of course. More than two dozen satellites, in orbits out to about ten thousand kilometers above the surface, were cooperating with a seismic net slowly spreading out from Nest in working out the planet’s internal structure, surface details, and atmospheric behavior. Progress was at about two doctoral theses per hour, Ben Cloud estimated.

And, presumably, each hour was also bringing Jessi Ware Icewall and Maria Flood Yucca seventy or eighty kilometers closer to their husbands. *Jellyseal* was making good speed.

She was also getting close to the dark side.

Actual construction of the new tanker system was going well enough, whenever decisions could be made; pseudolife techniques had taken most of the delays and difficulties out of actually making things. The problems of designing them remained, however. Ideas which seemed great by themselves would turn out to be incompatible with other equally wonderful ones when people attempted to grow them together. Whole assemblies which had promised well in computer simulation were embarrassing failures when grown and tried out. The communication lapse from *Jelly* was more than worrisome; her crew, who had the ordinary skills at pseudolife design even if they were not actually experts, presumably had far more knowledge relevant to the problem than anyone else on the planet.

The supposedly straightforward problem of traction on unknown surfaces for a vehicle expected to tow several times its own weight was attaining Primary status. Erni, Dominic, and several other sets of drivers were kept busy on test runs which ran, too often, straight into a new problem. Sometimes they didn’t think of their wives for whole hours, though they never failed to check in with Senatsu when they came back in.

“They’ll be seeing the last of the sun in an hour or two,” the analyst remarked at one of these meetings when the return distance still to be covered had shrunk to about thirty thousand kilometers geodesic. “They’re already a lot easier to spot, and don’t seem to be having any trouble finding their way. They’ve swerved two or three times, but never very far, and apparently for things like that fault of yours. That, by the way, is now about three meters high and seems to be still growing; it’s lucky it’s not on their return path. I’ve suggested that Ben send someone out to see how much horizontal shift it’s shown. I can’t tell from satellite—can’t get sharp enough ground motion details without a set of retroreflectors at a known location. Want to make the run?”

Dominic shrugged. “Okay with us, if Ben calls it. We might as well be doing something.”

Exchange Rate

"You are already, it seems to me. Well, we'll let him call it. If he thinks you'll be better off growing up with *Candlegrease* and *Annie* than someone else can go. Or no one, of course, if he doesn't think it's important enough."

Cloud, after only a second or two of thought, decided the information was important enough to rate a close look, and six hours later—people still had to sleep—*Quarterback* was heading away from Nest on a Hotpole bearing of about seventy degrees, with her usual drivers aboard.

Some changes along the track could be seen almost at once. The tall growths which seemed to be springing up where vegetation had been crushed on their first trip out were now much taller. What had looked like two-meter stalks of deep red, dark brown, and dead black asparagus now resembled giant saguaros with, in many cases, the bases of what had been separate stalks now grown together. A former clump or thicket now seemed like a single plant with multiple branches probing upward. Neither driver liked the idea of trying to plow through these, so progress became much slower and less direct. Sometimes they had to retrace some distance and try a new route. Eventually they settled for paralleling their former path rather than trying to follow it.

They speculated over the chance that the organisms they had casually pulped the first trip out might be serving as food for saprophytes, and reported the idea back to Ben. Ten minutes later he told them to collect specimens. The xenobiologists also wanted data. Life on a virtually hydrogen-free world needed investigating. Especially life whose carbon content far exceeded ninety percent, as well as zero hydrogen.

Collecting would have slowed them even more, but Emi and Nic decided to do it on the way back and rolled on, with the fence of organ pipes to their right and a relatively clear path ahead.

The quakes produced by the still active fault made themselves felt well before the actual structure came in sight, and *Quarterback* was slowed accordingly. The operators stopped a short distance from the scarp, which was now, as Senatsu had reported, over two meters high. The big saprophytes, if that's what they were, were not doing very well in the quake area, and no longer formed a barrier. It was therefore possible to follow the verge to the right for several kilometers; but no practical way down could be found. Neither man trusted the structure of their vehicle enough to drive over the edge under local gravity, even without the problem of getting back up. Also, even if the body had survived, the impact would probably have treated the men like dynamited fish.

Servobugs—waldo-controlled pseudolife vehicles ranging from ten centimeters to half a meter in length and eight kilograms to nearly eight hundred in weight—were of course cheap, and they wasted one of the smallest and presumably sturdiest in a test drop over the edge. It did not survive, but the sacrifice was considered worth while.

At this point Senatsu made another report, changing Ben's plans and frustrating several xenobiologists. *Jellyseal* had passed out of the sunlit zone, and seemed to be having trouble finding its way. Guidance information had been sent from Nest as before.

This time it was not followed.

Requests to stop and perform specific maneuvers to show that Nest's messages were being received also went unheeded, or at least unanswered.

Ben, knowing his personnel, promptly suggested that *Quarterback* drop its present mission and try to intercept the tanker. After all, things might as well be official, and the husbands would certainly do this anyway. Senatsu and her helpers would do their best to provide guidance starting from the runabout's current position.

There was no need to go back to Nest for supplies, since all the vehicles had full recycling capacity and adequate energy sources. Knowing this had discouraged Cloud from even thinking of sending

anyone but the two husbands. Upon hearing of the new behavior, and without even waiting for the first guidance messages, Emi swung their vehicle Hoteast—a quadrant to the right of the line toward Hotpole—and slanted away from the scarp. Haste was not exactly a priority with the two drivers, since they would be many days on the way whatever the machine driven by their wives might do, but there would be no delay. Worry was back in charge.

The geodesic connecting the two vehicles of course no longer crossed into Hotside, rather to Ben's annoyance. He wanted more detailed information about the problems of driving in sunlight, for use in future mission planning. His nature, however, was practical as well as sympathetic, and he made no suggestion to either Senatsu or the *Quarterback*'s drivers about slanting a bit to the left if opportunity occurred. Two or three times in the next weeks he had brief hopes that the only practical path the mappers could find might lead a little way into sunlight, but each time he was disappointed.

Emi and Nic were not. They were worried—still no word from their wives—and frustrated as Senatsu guided them through a maze of hillocks, around obstacles organic and topographical, past puddles and lakes of unknown composition, and once for over fifty kilometers paralleling a cliff about as high as silicate rock could be expected to lift against Halfbaked's gravity. She had warned them against getting within a kilometer of the edge of this scarp; they were on the high side, and there was no way of telling whether or when the tonnage of *Quarterback* combined with the fantastically rapid erosion by the fluoride-rich wind and rain would trigger collapse of the whole section of landscape. Being part of a seven-gee landslide would not be noticeably better than being under one. She had only used the route at all because it offered tens of kilometers of relatively flat surface which would permit maximum speed; and even then, she and Cloud had debated the idea for some time with Nic and Emi out of the comm net.

No one felt very much better when, some ten hours after the *Quarterback*'s passage, the cliff did collapse in four or five places as far in as the runabout's track.

"I wonder," Nic remarked when Ben relayed this information, "whether I'll yield to temptation a few years from now. It'd be so easy to turn ten hours into ten seconds when I'm telling about this to the kids."

Then of course it was too late to bite his tongue off. Emi, who was driving at the time, said nothing for several seconds; then his only words were, "I'm sure I would."

The *Jellyseal* was making poor progress, according to the satellite observations. Time and again she seemed to have headed into a dead-end path and had to backtrack. One encouraging fact was that the same mistake was never made twice; it looked as though the drivers were on the job. No one could yet believe that the following of the earlier instruction had been coincidence, so the general idea was now that whatever had gone wrong earlier with the tanker's transmitters had now spread to the receivers as well. What this might be seemed unknowable until the machinery could be checked at first hand; all the communication gear in every vehicle on the planet was multiply redundant. Disabling it should take deliberate and either highly skilled or savagely extensive sabotage.

No one could suggest a plausible or even credible motive for either the drivers or the natives to do such a thing, and it seemed highly unlikely that the latter would have the requisite specific skills in spite of their obvious familiarity with microwave transmission. Knowledge of principles does not imply ability to design or repair complex unfamiliar equipment.

But the tanker remained silent and apparently deaf, though it continued to move as though guided by intelligence.

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"At least," remarked Emi after they had received another report from Senatsu that their target was once more backtracking, "They're not forcing us to make changes in *our* path. If the girls had actually been making headway back home, we'd have had to change our own heading all the time."

"Come on, young man," came Senatsu's indignant voice. "Don't you think I'd have been able to work out a reasonable intercept for you? I wouldn't have kept you heading for where they were at the moment. I know you're worried, but don't get insulting."

She was not really indignant, of course, and Emi knew it, and she knew Emi knew it. The art of trying to keep the youngster's mind off his troubles was now being widely practiced at Nest. It was lucky that most of the divergently planned help efforts had to funnel through one person.

In a way Emi knew all that, too. Oddly enough, the knowing did help. People may resent pity, but honest sympathy is different; it lacks the condescension.

Maybe that was why so few people seemed to feel that Dominic needed help, too.

Actually, the efforts were not really necessary most of the time. The journey itself was far from boring. The basic need for constant alertness when running at high speed across poorly known topography left little time for unrelated thoughts while on duty, and caused enough fatigue to ensure deep sleep between hitches. The world itself was different enough from anything familiar to human explorers; it took much of the attention not needed for guiding the runabout.

Not all of the differences were obvious to the operators. Power consumption of the vehicle, for example, recorded at Nest, indicated that it spent over two thousand kilometers climbing one side and descending the other of a three kilometer high dome; Nic and Emi heard only indirect echoes of the arguments as scientists tried to match this information with that from satellites and seismograms.

The assumption that the world had a nearly equipotential surface, with strength of crustal materials essentially meaningless, was presumed to be even truer here than on any merely one-gee planet. The drivers had not noticed the changes in actual drive power needed to keep a given speed; they merely knew they were three thousand kilometers closer to where they wanted to be.

They could tell, of course, when it was *possible* to keep a given speed; only rarely was the way open enough—and when it was, they had to be even more alert for the strange things which might change that happy state.

Once, and once only, was there an animal, a definitely living thing moving sluggishly across their path leaving a track entirely stripped of vegetation, large and small. There was no way to see its underside, and hence no way to tell whether it was traveling on short legs—which would presumably have had to be numerous—or, though no trail was visible, something like the slime track of a gastropod. The biologists did manage this time to get a plea through Ben's near-censorship. They wanted the *Quarterback* just to change course the slightest bit and roll the thing over *en passant*, and leave a servobug or two to examine it more closely...

The drivers were not sure their vehicle could roll over something about its own size, and even less certain that the creature itself could do nothing about it if they tried. They promised to make the effort when the present emergency was ended, preferably much closer to possible help

from Nest, and drove on. The bugs were controllable from only a short distance in the biological static.

The debate was picked up by the natives, who wanted to know what "animal" meant. No one could explain with the available symbols. This was not surprising; but during the next hour Nic and Emi saw, swooping around their vehicle, objects which looked like the familiar blowing bits of black paper at a distance but which, seen close to, were clearly gliders—tossing, banking, and whirling in the wind as though barely under control, but clearly aircraft. This was duly reported to Nest. The report, presumably detectable by the natives, elicited no comment from them.

Quarterback was now a little closer to the sunlit slightly-more-than-hemisphere (the star covered fourteen degrees of sky). The generally active tectonics had not changed significantly, but the air was decidedly warmer and the plants, possibly in consequence, more luxuriant. Nothing resembling leaves had been seen yet, again unless the apparently charred blowing sheets qualified, and there were bets among the biologists on whether such organs would be present even under direct sunlight. The drivers of *Jellyseal* had failed to report any, but this meant little when one considered the planet's area. Special enlarged organs for intercepting stellar energy did seem a bit superfluous with the star scarcely a twentieth of an astronomical unit away. However, considering the illogical structure of vertebrate retinæ, there was no predicting all the odd paths regular evolution might take.

Cloud made few requests of the husbands, no matter how urgently his halo of researchers begged. He did pass on to them the suggestion that more and bigger plants might mean more if not bigger animals, but left any changes in driving policy up to them. They made none; they were already as alert as human beings could well remain.

The final two thousand kilometer segment of the run was frustrating, over and beyond the general annoyance built up over twenty-two days of unbroken driving. The men were, in what now might almost be called straight-line distance, less than three hundred kilometers from their still moving goal. They could not follow a straight line; that way was a labyrinth of seamed, faulted,

broken hills where even the satellites could detect almost constant rockfalls. The *Quarterback* would not have to be hit by a rock; a wheelbarrow load of sand could put her instantly out of commission, and help was now tens of thousands of kilometers away. There was no option but to go around the region. Senatsu was apologetic about not having seen the details sooner, but she was easily forgiven; her attention had been confined by their own needs to areas much closer to the travelers for nearly all the trip.

Emi responded to the news with a rather rough jerk at the steering controls; his partner fully sympathized but made the signal to change drivers. The younger man had enough self control to obey, and the runabout set off in a new direction with *Jellyseal* now off toward its left rear. The sky and its omnipresent clouds flickered even more brightly than usual, as though in sympathy—or perhaps derision. Fortunately, neither driver had reached the state of personalizing the indifferent world. No one even considered how close this state might be.

It would not of course have bothered the planet, but could easily have distorted important judgements.



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Cloud, whose telemetry had of course reported the moment of rough driving, was a little worried; but there seemed nothing he could do, and nothing he should say, about the matter.

The two thousand kilometers took three infuriating days, though the last few hours were eliminated by *Jellyseal's* luckily, though apparently fortuitously, moving to a more accessible spot and actually stopping for a time.

The pause might have been due to her being in the center of a twenty-kilometer nearly circular hollow—almost certainly *not* an impact crater—with eight different narrow valleys leading from it. She had already explored two of these, according to Senatsu, and been forced to turn back; maybe the drivers were debating which to try next, Ben suggested.

Neither husband could believe this for a moment. They knew their wives would have planned such a program much earlier. The faces behind their breathing masks were now grim. They made no answer to Cloud, but Emi, now driving again, sent them zigzagging at the highest practical speed along a rock-littered canyon which Senatsu had assured them would lead to the hollow. Nic did not object. The sooner they were out from between the looming eighty-meter walls, the better their chance of living to see—

Whatever might be there to be seen. The satellite images were, after all, only computer constructs.

Rocks fell, of course, but continued to miss. Neither man had any illusions about how much of this was due to driving skill, but neither gave it much conscious thought. The canyon opened into the valley twenty kilometers ahead.

Fifteen. Ten. Five.

They were there, and neither even felt conscious relief as the threatening cliffs opened out. They could not at once spot the tanker, and stopped to look more carefully.

The trouble was that none of the vehicle's lights were on. Deep-lights might of course be out because it was not moving, but the floods, and the smaller but sharp and clear running and identity-pattern lights which should have been on were dark, too. It was long, long moments before Emi perceived the tanker's outline against the faint, flickering, and complex illumination of the lightning-lit background.

He pointed, and Dominic nodded. The younger man had been driving through the valley, but now Nic took over and approached their motionless, lightless, and possibly—probably?—lifeless goal. Emi was calling frantically into the short-range multiwave communicator. Neither was surprised at the lack of an answer; frantic was a better word.

Tracks, wheels, and much of the lower body of the tanker were crusted with something white, but the men paid only passing attention to this.

There should at least have been light coming the cockpit. There wasn't. Something else strange about the windows seized the attentions of both men, but the *Quarterback* was within fifty meters of the other machine before this got the door of consciousness open.

Lights inside or not, the windows should have been visible as more than dark slots. Anything transparent, silicate or not, reflects some of the light trying to get through.

But the sky, which was a good deal brighter than the ground, was not being reflected from *Jellyseal's* windows. They were lightless gaps in the not-very-bright upper body. And the reason now became clear to both observers, drowning out the screaming denials of hope.

The windowpanes were not there. Maybe, of course, the occupants weren't there either, but where else could they possibly be? And more important, where else could they possibly be alive? What besides local air was in the tanker's cockpit? Even Dominic, with the means of looking waiting at his fingertips, had trouble making the fingers act.

But they did, slowly and much less surely than usual. He slipped into waldo gloves, and a servobug emerged from the runabout. Briefly—perhaps less briefly than usual—it checked out its limbs and lights, and made its way across to the tanker's relatively monstrous hulk.

It could climb, of course. There were holds on the outer shells of all Nest's vehicles, the bug had grasping attachments on its "legs," and the machines had been designed and grown to be used in rescue techniques as well as more general operations. It made its rather fumbling way up *Jellyseal's* front end, and finally reached the openings which had once held barriers intended to keep in the flotation water, keep out one of the few environments in the known universe more corrosive than Earth's, and still let light through. Nic was guiding the little machine by watching it from where he was. Not even Emi asked why the bug's own eyes had not been activated yet.

Yes, the windowpanes were gone. Yes, the bug could climb inside with no trouble. Yes, the last excuse for not using its own vision pickups was gone. Without looking at his partner, Nic turned on the bug's eyes and his own screen.

It could not at once be seen what was in the cockpit. Nothing human showed, but that might have been because vision reached little more than a meter into the chamber. It was blocked by a seemingly patternless tangle of twisted branches, ranging from the thickness of a human middle finger down to rather thin string. The colors filled the usual range for Halfbaked vegetation, from very dark maroons and browns to dead black.

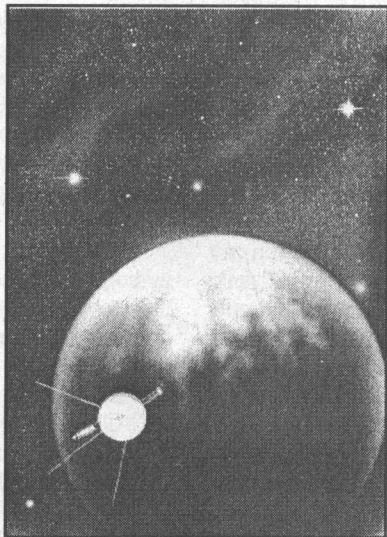
The stuff was very brittle, far more so than anything living should have been. Nic tried to get farther inside. The bug, under his waldoed direction, reached out to one of the thicker stems and tried to use it as a climbing support. Several centimeters of the growth vanished in dust and the machine overbalanced and fell into the cockpit. It left an elevator shaft as it pulverized its way to the

floor, and Nic had to go through cleaning routines as black dust slowly settled through the dense air around and upon his mechanical agent.

Both men were now watching the relay screen, but things weren't much improved. The bug was still surrounded by the tangle, and as it moved slowly across the floor kept smashing its way through a three-dimensional fabric of seemingly charred growths. The stuff was brittle, but not really frail. A significant push, comparable to the bug's weight, was needed actually to break the thickest of the branches. It was only when they broke that they went to powder.

The cockpit was far larger than that of the *Quarterback*, more than five meters across and eight long, and it was many minutes before most of the floor had been examined. The bug was now moving around under an artistically tangled ceiling twenty centimeters or so high, supported by many pillars of unharmed branches. It left tracks as it went in a two or three millimeter thick layer of black powder containing many short fragments of the branches.

There was no sign of a human form, living or otherwise, anywhere on the floor, but there was all the evidence anyone could ask that the tangle above could never have supported a human body in the local gravity, and flotation water was gone. Emi finally reported this aloud, his voice as



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expressionless as he could make it, and summarized the observations forcing this conclusion. Ben acknowledged and opened channels for everyone at Nest.

"We want to look farther, not consult!" Nic objected. "There ought to be some sort of indication what happened. Where did the windows go, anyway?"

"They'd probably be the first things to give if the refrigeration failed and the water boiled suddenly over in the daylight," Cloud pointed out reluctantly, "unless someone who knows the structure better doesn't think so. Speak up if anyone does. Anyway, it seems better for you to bring the tanker back here for really close checking, and if at all possible *not* spoil any more evidence in the cockpit. The growths you reported seem to be very frail, and therefore different from the ones we've seen, and it would be better if there were something besides powder to be examined here. Don't think we're forgetting about the girls, but if there's to be any hope of learning what happened, we need data. You can see that."

"We can see it," retorted the younger driver, "but there are still items we'd like to examine ourselves."

"What? There was only that one compartment they could have lived in. The whole rest of the machine was paraffin tank, with its contents melted wax for the last part of their trip, and presumably native air for the return—unless you think it was evacuated when the cargo was unloaded, and you'd have seen if it were flattened. So would Sen. What do you think you can find, anyway? You're not set up for microscopic or high class chemical testing."

"We could find leaks, if they were big enough to—make things happen so quickly there couldn't be any alarm sent back."

"I'd think small ones could have wrecked communication before they knew anything was wrong. But all right, I'll take it on my responsibility—go ahead and look for leaks between cockpit and tank, but do leave *something* of the stuff you've been smashing up for people to study."

"All right. But how do you expect us to get *Jellyseal* back with her cockpit uninhabitable? There's no way for us to refill it with water even if we could reseal the window openings."

"We're working on that. Go ahead and make your search."

The men obeyed, Emi rather sullenly, Nic more thoughtful. The floor and rear bulkhead of the cockpit and the rear third of each side wall were between living chamber and cargo space, so there was a large area to be examined. How this could be managed without destroying all contact between walls and branches was not very evident. Human remains are large enough so that the first search had left many columns of undamaged vegetation still touching the floor, but to examine the walls for pinholes or even nail holes would be another matter. Nic thought for two or three minutes before trying anything, his partner waiting with growing impatience.

"You know," Yucca said slowly at last, "if there was actually a leak between cockpit and tank, would the windows have blown out? There's a lot of volume back there for steam to expand into, even if it was nearly full of wax. There were several cubic meters full of local air to allow for the paraffin's expanding as it warmed, whether it melted or not."

"I still want to look."

"I know. I don't want to give up either. But think. Whatever chance the girls have of being alive, it's not on board that machine. The natives could have—"

"You mean they might have. But would they have known how? Could we keep one of *them* alive anywhere near Nest, when we have no idea about what they need—except maybe in temperature? And if they're alive, why haven't they called us?"

Dominic gestured toward the tanker a few meters away. "What with? Do you think any of the comm gear is still in working shape?"

"You two find that out, pronto," came Ben's voice. "There's a good chance, the design crew thinks. If enough of it works you can use the bug that's in there now to handle it. You find out whether it can still be set to receive short-range stuff from you, or if the controls are in shape to be handled by the bug itself. In one case, it may be possible to set up for *Jelly* to follow you by homing on transmission from your car. In the other, it'll be a lot harder, but one of you using the bug's handlers should be able to drive *Jelly* while the other runs *Quarterback*. That'll be almighty slow, since you'll have to stop to rest pretty often instead of swapping off, but it should be possible."

"But—" started Emi.

Cloud spoke more gently, and much more persuasively. "You both know most of what little chance there is that they're alive is if they're somewhere under the sun. We don't know just how smart these natives are, but remember that *they* got in touch with *us*, after hearing our satellite and vehicle transmissions. Let's get that machine back here and find out what we can from it. Even if time is critical, and I can't say it isn't, aren't the odds better this way? We can try to ask the natives, too, though a lot of language learning will have to come first, I expect."

"How do you know the odds are better?" Emi was snapping again.

"I don't, of course," Ben maintained his soothing tone. "but to me they *seem* better with a whole population of smart people working on finding out just what did happen."

Nic nodded slowly, invisibly to Cloud but not to Emi.

"I suppose that makes sense."

"Something else makes sense, too," Emi added grimly.

"What?"

"Tricia got the idea that the natives were pleased with the variety of hydrogen compounds we'd supplied. I wonder just how big a variety they got."

"And I pointed out that the tanker did have a lot of different hydrocarbons, which I think the locals call carbon hydrides," Nic countered instantly. There was at least a minute of silence.

"All right. We'll bring it back if we can. But I'd like to know one thing, if Tricia can decode it from the local static."

"What?" asked Ben

"Do the locals know what water is, or at least do they have a recognizable symbol for it even if they call it oxygen hydride, and—did they thank us for any?"

Again there was a lengthy pause while implications echoed silently around in human skulls. No one mentioned that the request was for *two* things; it didn't seem to be the time.

"She'll try to find out," Ben answered at last, in as matter-of-fact a tone as he could manage.

"Okay. We'll go over *Jelly's* controls." Dominic, too, tried to sound calm.

The controls did seem to be working. This was not as startling as it might have been; all such equipment was of solid-state design and imbedded—grown into—the structures of the various vehicles. There might be mechanical failure of gross moving parts, but any equipment whose principal operating components were electrons stood a good chance of standing up in Halfbaked's environment as long as diamond or silicon were not actually exposed to fluorine.

There seemed, however, to be no way to set up the tanker's system simply to home on a radiation source, moving or not. No one had foreseen the need when the machine was designed. The closest thing to an autodriver in any of the vehicles was the general-shutdown control. There were no smooth paved highways with guiding beacons or buried rails on the planet. While systems able to avoid the ordinary run of

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obstacles on an ordinary planet were part of the common culture and could have been incorporated in the Halfbaked-built machines, these were *exploring* vehicles. Avoiding obstacles was simply not their basic purpose. It had been taken for granted that they would be operated by curious, intelligent people who had a standard sense of self-preservation but would be willing to take risks when appropriate.

That left trying to drive *Jellyseal* with the handling equipment of a servobug. This proved possible but far from easy, and even Emi agreed that an hour or two's practice in the open area was probably a good idea. With some confidence established by both, Dominic sent the *Quarterback* toward the valley by which they had entered while his younger companion, looking through the rear window of the cockpit, concentrated on keeping the larger vehicle a fixed distance directly behind them.

He was feeling pretty confident, almost relaxed, by the time the entrance narrowed before them.

With a brief exchange of one slightly questioning and one somewhat shaky "Okay" they entered the passage, very conscious that even at its empty weight the larger vehicle was much better able to shake the walls down on them than was their own runabout. Of course, *Jelly* also made a bigger target; but possibly a few dents or even a few holes in its body might not be critical now. Of course assuming that a house-sized boulder with the potential energy provided by a hundred meter cliff under seven plus gravities would merely *dent* its target did seem unreasonably optimistic. Both men were optimists, even with the present probable status of their wives, but they were also reasonable; and while Nic did fairly well at concentrating on his driving, Emi's eyes kept wandering much too often from *Jellyseal*'s bulk behind them to the cliffs beside and above.

As earlier experience had warned, rocks did shake loose from time to time. It seemed very likely that the vibration of their own passage was the principle cause, since most of them slashed across the narrow way somewhat behind the *Quarterback* and its companion.

Not quite all. Four times a deafening bell-like clang reached the men's ears, deafening in spite of the poor impedance matching between the planet's atmosphere and their vehicle's body, and between the latter and the water inside. The bodies of the machines were not, of course, of metal, but they had enough metallic elasticity to ring on impact.

Jellyseal was the victim all four times. Fortunately the missiles were much less than house-sized and *Jelly* seemed not to suffer enough damage to keep her from following. This fact did not cause Dominic to relax until they were out of the danger zone and had started to backtrack their way around the Patch of Frustration, as they had named it.

At this point, Ben called again.

"There's a new track for you. You don't have to go back around to the way you came. Stand by for directions—"

"Stand by for directions—"

"Stand by for directions—"

That became the routine through their waking hours and days for the ensuing weeks. What with sleep time and difficulties in guiding their "tow," they averaged less than seventy kilometers an hour. The weeks went by, the monotony relieved by Senatsu's messages, variations in wind and weather, and local biology. No more animals had been seen, or gliders, though the latter had inspired much argument at Nest. Neither had anything been said about the pot the two drivers had presumably won on the way out; neither man thought to mention it, and for some reason no one at Nest brought the matter up.

The men were simply far too busy to think very much about the missing women, though they certainly did not forget them. When it was reported that *Candlegrease* was about ready, and Ben suggested that she be loaded and start at once for the native "city" with another crew, Nic

and Emi both protested furiously. They tried to be logical; Emi insisted that talking with their wives during the first trip had given him and Nic a better idea of the route and its problems than anyone else could have. Ben countered that everyone on Nest had heard the conversations as well, and if necessary could replay the records of them. Nic supported his partner, pointing out that there had to be shades of meaning in the messages which only people who knew the speakers really well could be expected to catch. This was an unfair argument to use against the unmarried Cloud, but fairness was not on either driver's mind at the moment. Ben privately doubted the validity of the argument as any bachelor might, but had no wish to be sneered at—by many people besides the bereaved husbands—for preaching outside his field of competence.

He tried to point out the value of time. Nic countered with the value of familiarity; he and Emi were, aside from Maria and Jessi, the only people who had traveled really far from Nest. Cloud gave up at this point, agreed to wait for their arrival, but used their own argument to insist that two additional drivers go with them to gain experience.

Emi asked pointedly, "Is *Candlegrease* set up to support a crew of six?" The coordinator almost gave himself away by asking *what* six, but made a quick recovery.

"It will be by the time you get here." Suggesting that there would probably be no need to take care of six was obviously unwise and might, just conceivably, be wrong. Human life, even other people's, means a lot to civilized beings. A species which has survived its War stage and achieved star travel practically has to be civilized.

Ben kept his word. The second tanker was ready, loaded, and set up to keep the women comfortable if they were found, by the time Emi and Nic got back to Nest. There was a second argument when they insisted, or tried to insist, on starting out at once to the hot side in spite of their extreme exhaustion. Ben won this one, but only by promising not to let *Candlegrease* move without them, so almost another Halfbaked year passed before the medics pronounced the two fit for the trip.

There had been no delay, of course, in examining *Jelly*'s cockpit, though this had to be done with bugs. Bringing the machine into the garage and flooding it with water so that living researchers could swarm into it would quite certainly destroy any evidence there might be.

It was quickly discovered that breaking the brittle contents did not pulverize the whole branch, merely two or three diameters to each side of the break. Cutting or snipping at two points far enough apart, therefore, detached an apparently undamaged section. Since the tank was full of the stuff too, there was no shortage. After a few mistakes resulting from failing to catch them on something soft as they fell, several lengths of the material were brought into "outdoor" labs, and biologists and chemists went happily to work with their bugs.

The material was not very different from the tissues already investigated from the local vegetation. It was rigid rather than pliable, of course, and it finally occurred to someone that the stuff, having come from the hot side, might merely be frozen. This was easy enough to test. A sample was heated up to the probable temperature, as indicated by radiation theory and measurement from the satellites, of the Hotpole latitude where the "city" seemed to be. Long before it warmed up that far, the branch being tested was flexible as rope. Several of the investigators began privately to wonder whether they might be working over the remains of one of the intelligent natives, though no one suggested this aloud until well after *Candlegrease* had departed. Ben had the idea, but decided to save it; Emi might get bothered again.

What brought the question into the open was the observation that after a day or so at high temperature, most of the branches, or roots, or vines, or whatever they were began to grow fine tendrils. The stuff was still alive.

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This was quickly reported to Ben Cloud, leaving him with the decision of how much to pass on to the now fairly distant second expedition. On one hand, the information was clearly critically important to anyone expecting to be in direct contact with the natives. On the other, Nic and Emi might be uncomfortable to learn that their examination of *Jelly's* control compartment might have dismembered one of the people they were going to meet.

Or, considering what had so probably happened to their wives, they might not. The other two drivers were a married couple, Pam Knight and Akmet Jinn Treeferm, and the Treeferms might keep the other two in discussion rather than brooding mode. Ben hoped the fact that they were short, stocky, extremely sturdy people from a one-point-four gee colony world would not become important, but he was getting uneasy over Emi's patience limits.

Ben was still trying to make up his mind—there was plenty of time yet before the travelers could presumably meet any day side natives—when another discovery was made.

One of the many short sections of branch from the debris on the floor of *Jelly's* cockpit had been part of one of the samples to be warmed up. It had not responded; it had neither softened nor grown extensions. After giving it several days, first with the rest of the sample and then by itself, it had been sequestered for more detailed study.

Halfbaked's life, it was now known, consisted mostly of carbon, with modest traces of nitrogen, oxygen, and heavy metals such as iron and titanium. The complexity needed for biological machinery was obtained not from hydrogen bonding within and between proteins and carbohydrates but from variously sized fullerenes and graphite tubes flared, tapered, curved, and branched by occasional heptagons, pentagons, and octagons in their mainly hexagonal carbon-ring nets. The "protoplasm" was considerably coarser, on the molecular scale, than

anything known before to human biochemistry, and its peculiarities were contributing heavily to the PhD-per-hour rate Cloud liked to brag about.

The unresponsive segment was quite different. It had a fair amount of carbon and some iron, but there was far more sodium, calcium and phosphorus than had ever been found in the native life, and the carbon for the most part was tetrahedrally bonded. It took a while to discover the reason, and this happened only when one of the chemists sat back from her diffraction spectrometer and its confusing monitor pattern and took a close naked-eye look at the specimen.

Then she called for a medical helper, who needed one glance.

The branch was the charred remains of a human little finger.

This made Ben's communication problem more difficult, but in another way. It also forced him to face it at once. He faced it, reporting as tersely and calmly as he could to the distant *Annie*.

"But why only a finger?" tiny Pam asked instantly, before either of the now confirmed widowers could react. She was honestly and reasonably curious, but was quite consciously trying to ease the shock of the message for the husbands. It was not really necessary; Nic, and even Emi, had become more and more ready to face the news as the weeks had worn on. "You two went over the whole floor, square centimeter by square centimeter, you said. Why didn't you find a lot more—and a lot more recognizable? Maybe it's just as well you didn't, of course, but still I don't see why."

Dominic was able to answer at once, though Emi had thought of the explanation as quickly.

"It was small, and they missed it."

That was all he needed to say. Even the "they" needed no clarification. Everyone in the tug heard that much and could picture the rest. Ben Cloud and more than fifty of the Nest personnel who were in the comm link could do the same. They listened while Dominic, in surprisingly steady tones, went on, "Ben, did Tricia ever get an answer to that question we asked a while ago about the natives and *water*?"

"Not that I know of." Cloud found his voice with difficulty. He had expected losses on Halfbaked, but the fact that none had occurred in the nearly half a Terrestrial year the party had been there had undermined his readiness. "I'll try to find out. Carry on. And we're sorry. I don't know what else to say that wouldn't be pure Pollyanna, but you know we mean it."

"We know."

"You also know, I expect," Ben's voice was even softer, "why I had another pair of drivers with you." It was not put as a question. Ben, a slender half-gravity colonial, did not commonly think of muscle as useful, but he was a realist.

"Yeah. Thanks. Don't worry. Emi, time for you to take over. We still have things to find out up Hotnorth."

The sun would be starting to rise in another two thousand kilometers or so. Temperature was higher, though the principal surface winds still brought chill from the dark side; turbulence sometimes mixed in air from above, not only coming from sunlit regions but heated further by compression as it descended. Dominic still sometimes contributed to Emi's financial security with an attempted weather forecast, but the variables he could think of were becoming too numerous even for his optimism. Motivation for such predictions remained high; they had identified another potential trigger for landslides. Suddenly hot or suddenly—by two or three hundred Kelvins—cold blasts of wind sometimes cracked off scales of rock by thermal shock. The cracks, fortunately, were never deep; but the layers peeled off were sometimes extensive and their shattered fragments dangerous, especially as the pieces were often thin enough to blow around.

The tank in tow was struck several times, forcing travel to cease while it was examined carefully by servobugs, but so far damage had

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been confined to small dents. The one strike on *Annie* had caused no damage at all, possibly because the traction problem had forced her to be grown with much extra weight.

They had seen and avoided the common puddles of unknown makeup, but as the sky ahead grew bright these became larger areas and more frequent. *Annie* avoided them, though the returning *Jellyseal* apparently had not. The white crust on her tracks and lower body had turned out to be mostly cryolite, sodium aluminum fluoride, regarded by Greenland natives on Earth as a peculiar form of ice because it would only melt in the flame of a blubber lamp.

It was now pretty obvious who, or what, had driven the tanker homeward. Dominic had already compared the fate of the driver with that of his wife, but had not spoken about it to anyone. For one thing, a lot of the *how* remained to be worked out. The tangle of apparent vegetation might, after all, have been some sort of remote control system; this world's plants did emit and receive microwaves. Maybe no intelligent being had been on board, at that. This could all tie in with the natives' immediate spotting of, and beaming signals to, the satellites when these had gone into operation months before. The graphite microtubes in Halfbaked tissue often circulated metal ions and could serve as antennae, among many, many less obvious things. It seemed more and more necessary, and more and more easy to believe, that the real life was at the source of the signals. And maybe *one* of the girls . . .

No. Don't think of that. Whatever had happened to them had happened very quickly—one could believe that, at least—and pretty certainly to both of them at once.

But it looked as though veering around lakes might not be really necessary, since they were going Hotnorth and anything that froze on the vehicles now should melt off again shortly. Nic did suggest this. Pam vetoed the idea at once.

"How do we know how deep these things may be?"

"Do we need to? We'd float. We're only twice as dense as water."

"That wouldn't matter to us, but could we drive, towing like this?"

Nic had no answer, and they continued to stay on solid, if sometimes shaky, ground. Neither of the other men had taken part in the debate.

Just as they glimpsed the upper limb of the sun, a new sort of adventure eased the boredom. They were threading their way through a stand which looked much like the "Saguaro" patches Nic and Erni had found earlier. The growths were not always far enough apart for the tank, and much as they disliked it, there was sometimes no alternative to hitting and bending pairs of these, or sometimes breaking them completely. They were leaving a clear trail, not that this was their main worry.

Nic was glad afterward, though he was far too busy otherwise to think of it at the moment, that none of his attempted weather predictions was pending. With no warning at all a far stronger wind blast than any of them had experienced so far made itself felt to the driver. Organ-pipes bent and snapped in all directions.

And, though there had been no lightning, burst into flame. For minutes they drove through the enveloping blaze, making no effort to avoid anything. The mere fact that there was no free oxygen outside meant nothing; it had not occurred to anyone to consider what the paraffin would do in unlimited supplies of this atmosphere. There was no free fluorine to speak of, but the variety of fluorine compounds actually present offered far more possibilities than any of them had time to consider. Pam joined her husband at the driving controls; Erni, with remarkable self-discipline, beamed a running report of what was happening for any satellites in position to relay to Nest; Nic deployed one of the more versatile servobugs and drove it beside them, ranging back and forth along the tank and looking carefully for any signs of rupture. After a few seconds Pam, deciding her husband needed no help—he was

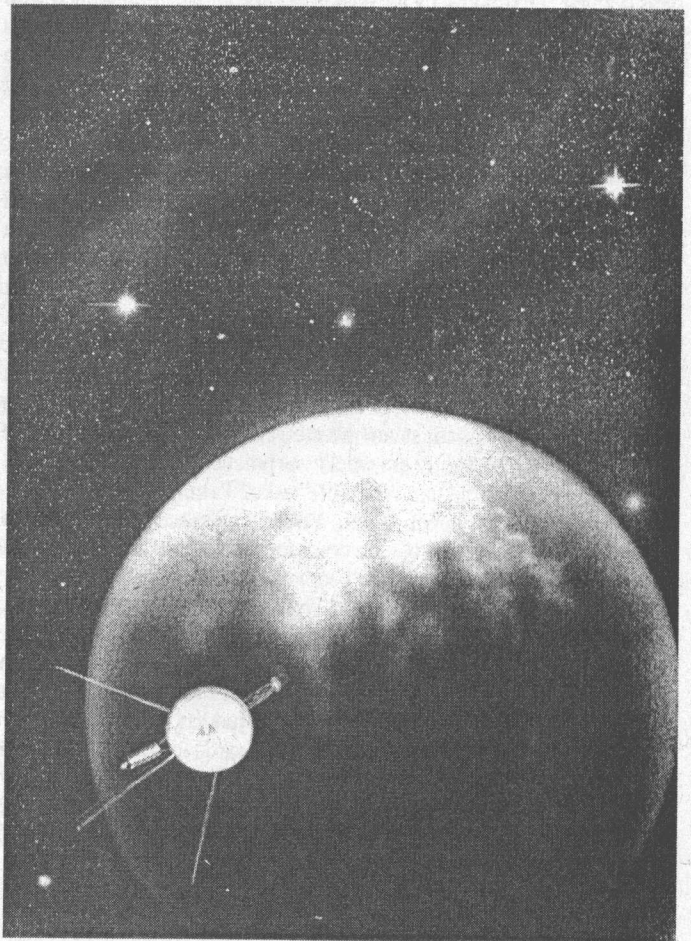
not attempting to dodge anything—took out another bug and covered the other side.

They were out of the stand, and out of the fire, and presumably out of danger after three or four anxious minutes. The wind now came strongly from ahead; Nic judged that the fire had set up a strong updraft which was bringing in air from all directions. Erni, with no wager going, didn't bother to disagree, and neither of the others found the suggestion unreasonable.

A few hundred meters from the nearest flames *Annie* and *Candlegrease* were stopped and all four of the crew made a slow and minute inspection of tug and tow using the bugs. There was little worry about their own vehicle; they would have been aware of serious damage within seconds of incurring it. A slow leak in the tank, however, was another matter. It was assumed that the natives were equipped to unload the paraffin at their end; they had been told as clearly as possible what it was, and would presumably be ready to keep any of the precious hydrogen from escaping. Also, they had made no complaint about the first delivery.

But no one had tried to find out what the paraffin itself would do to local life. It seemed very likely that hydrogen compounds would be about as helpful to Halfbaked's organisms as fluorine ones in comparable concentration would be to Terrestrial tissues. Also, many paraffin components were high enough in molecular weight to sink in the local atmosphere; they would be mixed and diluted quickly by wind, of course, but wouldn't rise on their own.

The travelers reminded Ben of this, and asked for suggestions. What if they *did* find a leak, even a small one? Should they come back, at least



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to Hotlatitudess where the paraffin would freeze again?

"I'll have to ask around," was all the coordinator could say after some seconds of thought. "Get along with your inspection, and let us know. For now, we'll assume the worst."

"What would that be, to you?" asked Emi.

"That you're leaking so badly there's no way of getting any of your load to where it's supposed to be delivered. That would make the decision easy, but I hope it isn't true."

So did the crew, but they were still careful.

There were half a dozen patches of liquid near and under the tank, but there were two similar ones near the tug, and several more within a few tens of meters. There seemed no reason to suppose they were hydrocarbons, since they seemed neither to be evaporating nor reacting with the now quite hot air, but they were watched carefully for several minutes, especially those under the tank. At Nic's suggestion, they moved the vehicles a hundred meters to an area where no puddles could be seen, and waited for more minutes.

Nothing dripped. No puddles formed. Nothing seemed to be leaking. This was reported to Cloud. He had had time think, or someone had, and his answer was, "Check every bit of the tank you can get an eye close to for the tiniest cracks, leaking or not, which may show. Remember the one in *Jelly*."

"What one in *Jelly*?" asked two voices at once.

"Didn't I tell you? No, come to think of it, that just led to more questions, some of them still not answered. We think we know what happened, now. The refrigerators meant to keep the paraffin from boiling when the surroundings got really hot did a good job, but when the liquid was drained, we suppose by the customers, the tank naturally filled with local air. Some of this, maybe sulfur trioxide, formed frost on the coils and insulated them, so air at its regular temperature—eight or nine hundred Kelvins or more, depending on the local weather—swept in and hit the rear bulkhead of the cockpit. This was too thick, it turned out."

"Too thick?" There were more than two voices this time.

"Too thick. A thin glass will handle hot washing fluid better than a thick one. The body composition of the vehicles is as strong as we could make it, but it's also a very poor heat conductor, as intended. It bent in toward the cockpit just a little under the pressure, and that added to thermal shock to start a U-shaped crack in the rear bulkhead from floor to floor, and straight along the floor, framing about ten square meters. The area was pushed into the cockpit momentarily by the atmospheric pressure, far enough to open a gap maybe one or two centimeters wide all around. The support water, or enough of it, boiled almost instantly, the windows blew out, and the steam pressure slammed the flap back where it had come from so tightly the crack was practically invisible."

"And you never told us? Why not?" asked Pam.

"Well, it couldn't happen to you. Your living space isn't even in the same vehicle with the cargo. One point for the towing idea."

"And several points minus for keeping us in the dark!"

"We'll check for cracks," added Dominic, as steadily as he could. They all turned their attentions back to the bugs.

The fire had almost completely died out. So had the wind from Hotnorth. Dominic, glancing away from his work occasionally, saw that the pillar of smoke was sheared cleanly at, he judged, nearly a kilometer above, with the higher part whipping back toward Hotsouth. It was high enough to glow for some distance in the sunlight against an unusually dark and cloud-free sky. He was tempted to try another weather guess, but firmly turned his attention back to *Candlegrease*'s body. So cracks could be really hard to see . . .

Hard, or impossible. None were found, but no one could be quite certain. Absence of evidence is not—

They drove on into heat and sunlight, more silently than before, with a bug following on either side, its operator constantly scanning the tank. More words were spoken in the next few hours by Senatsu with her guidance information than by all four of the tug crew together.

No one was exactly in a panic, of course, but everyone had enough sense to be uneasy. Emi and Nic were more relaxed than the Treefems now. At least they seemed to be.

"Open ground for about thirty kilos."

Ninety minutes of silence.

"What looks like a compression fold across your path ten kilos ahead. Two possible passes. The wider is four kilos to your right. Turn twenty-two degrees right to thirty-seven."

The planet's magnetic field was too distorted to provide reliable direction, but enough of the sun was now in sight to indicate Hotnorth—and make driving into it uncomfortable. The new heading was a relief.

The wider pass had walls high enough for the left one to provide shade for nearly a hundred kilometers, a distance which did not lift the star's disc perceptibly. The valley was not a recent feature; the walls on both sides were greatly collapsed and eroded. Had it been much narrower the travelers would have had a problem threading their way among the fallen fragments.

"Lake eighteen kilometers ahead. Stay close to it on its left." When they reached the lake, there was not very much rock-free space to the left of the liquid, but there was presumably even less on the other side; the drivers trusted Senatsu. She herself was developing more confidence as reports from the tug kept filling out her interpretations of the satellite radar.

She hadn't spotted the vegetation which grew densely along the shore, but this gave no real trouble. Emi and Nic thought of the fire now far behind, but there was no sudden downdraft this time. There was, as usual, lightning.

"It could happen," Dominic remarked. "The right wall is pretty high, and wind flowing over it would drop sharply and heat up by adiabatic compression—"

"How much?"

It was Akmet who asked this time, but Nic declined to bet. Emi wondered whether his friend was actually learning, or simply didn't want intruders in their friendly game. He said nothing; he was driving. Bet or no, there was no fire, and eventually the Hotnorth end of the lake came in sight.

"Head right along the shore."

Emi started to obey before realizing it was not Senatsu's voice. This was not too unusual; the Yoshihashis shared the muscular fitness supplied by constantly fighting water's inertia, but even they had to sleep sometimes.

"Who's on?" Emi asked, before realizing that the voice wasn't human either. The answer was unexpected.

"What?" This was Senatsu, recognizable even through the biological static, now familiar enough to be tuned out fairly well by the human nervous system.

"Who just told me to head right?"

"No one. You're in fine shape."

"You didn't send the message? Or hear it?"

"Neither. Repeat it, please."

Icewall did so.

"That did not come from here, or through satellite relay in either direction. Is it a native voice?"

"Turn right. You do not turn right."

Pam was quickest on the uptake, and was first at the communicator. "Why should we turn right?"

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"The symbol 'we' is unclear. Turn right for safety and information."

Erni had done a quick-stop by now.

"Sen, did you hear that?"

"I heard static only, none of it either unusual or structured."

Treefern glanced at her husband, who nodded. His smile was of course invisible. Pam nodded back.

"Sen, this is what we heard." She quoted. "Now, repeat that back to us, please. As exactly as your voice will let you, and emphatically word for word."

Senatsu obeyed, mystified but guessing this was no time for argument or question.

The message promptly came again, in the new voice, and the observer gasped audibly.

"I *did* hear that! It came through the link."

"I thought it might. They're not stupid, and certainly not slow. Erni, fire up and do what they say—but keep your driving eyes peeled!"

"For what?"

"How should I know? Anything. What do you usually watch for?"

Icewall drove without answering. It had started to rain, unheralded by Yucca, and Pam thought of a possibly useful question for their new guide. "How far?"

"Twenty-two point one kilometers."

"Sen, if you heard that, try to see what's that far ahead."

"Sorry. I heard it, but radar isn't getting through just now."

"Comm frequencies are."

"True. They're not very good for imaging, but I'll do what I can. Stand by."

The rain grew heavier, whatever it might be composed of, and Erni slowed sharply. The voice promptly came again.

"Why stop." There was no question inflection.

Pam answered slowly, with measured and carefully chosen words. "Not stopping. Slowing. Rain. Bad measuring."

"Rain. Bad measuring." was the acknowledgment. After a pause, **"No rain. Eight kilometers. Not slow."**

"Eight kilometers," answered the woman. "Sen, you heard that? Can you see what's eight kilos—kilometers—ahead?" There were many listeners by now. Most could guess why Pam had corrected to the full length of the distance label. They also wondered which form the unknown guide would use the next time distance was mentioned.

Tricia Feather's voice came through to the tug.

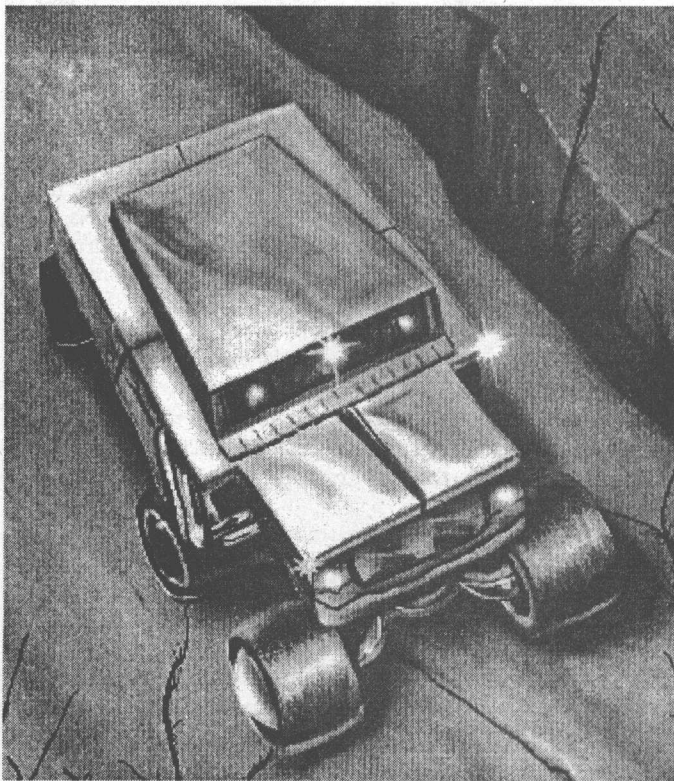
"Much more of this and the translation computer won't need my help! Willi, can you use a math assistant?"

None of the travelers paid attention to this. All were looking eagerly ahead for the predicted break in the rain. Not even Nic tried to second-guess the native.

The really interesting item, they agreed later, was that their informant had allowed not only for their own speed in his, her, or its prediction. The rain clouds had been traveling much faster than tanker and tug, but the eight kilometers was still right. Dominic bowed internally to superior knowledge and vowed to himself, as he had several times before, that Erni would get no more of his cash. Prediction was evidently possible, but not for a mere human being.

Or maybe he could set up some sort of private channel with the natives, and get some of his money back...

Neither he nor anyone else was particularly surprised at the sudden improvement in communication, though there was plenty of joy. The natives had been known to exist, had been known to be intelligent, and information supplies do build on themselves and grow exponentially. Maybe Erni's question about water could be answered soon...



"Look up!" Akmet cried suddenly. All except Erni obeyed; he chose to continue driving.

There were scarcely any clouds now, though a number of the blowing black objects still fluttered and swirled above and beside them. One, rather larger than the rest, was dipping, swerving, and wavering in much the same way, but was larger and had a more definite shape.

The tug drivers represented three different colony planets, but all had seen dandelions, which are almost as ubiquitous as sodium and human beings. The object looked like a vastly magnified bit of dandelion fluff. It had a shaft about two meters long, topped by a halo of wind-catching fuzz of about the same diameter, and with a grapefruit-sized blob at its lower end. It must have been incredibly light to be wind-supported in this gravity.

It was moving almost as randomly as the other jetsam, but not quite. The windhold at its top varied constantly in shape and size. All the watchers soon realized that it was controlling how much of its motion was due to wind and how much to gravity. Sometimes it lifted sharply, sometimes slowly or not at all; it blew horizontally now one way and now another, but most often and farthest the way Erni was sending the tug. He had speeded up when the rain had stopped, but now he slowed again to stay near the object.

"Go. Travel. Not slow."

"We want to observe," Pam transmitted.

"What?" asked Tricia from her distant listening post. Pam gestured to her husband, who described briefly what was happening.

The response was still terse, but comprehensible. **"Observe better forward. Not slow. Go."**

"Let's take its word for it. Go ahead, Erni. It wants to lead us to something, and this thing doesn't seem to be it."

Icewall shrugged, refraining from comment about "somethings" on this part of the world, and *Candlegrease* left the airborne object behind

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in moments. There were presumably fourteen kilometers to go, and the going was fairly straight.

It was a less impressive prediction this time; the target was motionless.

If this was the target. A branch tangle some fifty meters across and up to eight or ten high, resembling the filling of *Jellyseal's* cockpit, was spread at the edge of the lake, separated from the liquid by a meter high ridge of soil which might have been made by a dozer—or shovels. The ridge—or dam?—ran straight along the lakefront for three dozen meters or so, with each end bending away from the liquid to enclose partially the slowly writhing tangle.

“Left. Slow—left more—slow slow.”

“Slowing. Turning.” Pam was plainly addressing their guide. Then, “Close to the copse, Emi, I think it means.”

“I think so too.” Icewall veered very slightly to the right until the big tank was scarcely a meter from the edge of the patch of growth, then even more slightly left so they were moving parallel to it.

“Stop.”

“That’s it, I guess,” Nic added his voice.

“That’s it.” The guide omitted the man’s last two words. Its intelligence seemed to include a computerlike memory.

“Now we wait?” asked Emi, free from his driving.

“Wait. Observe.”

“Is that dandelion seed anywhere near us yet?” asked Akmet. “That’s what ‘observe’ was last used on, as I remember. I’d say it was ten or twelve kilos back by now, unless the wind was really helpful.”

“Observe.”

No one had time to ask *what*. From somewhere near the middle of the copse a duplicate of the “seed” popped upward and began to gyrate like the other as the wind took it. It was followed by several others. All four pairs of eyes were fastened on them, some through the finders of video recorders. Akmet was giving a vocal report to Nest in all the detail he could; there was no video contact through the biological static even via satellite at this distance. Ben and others were asking for clarification, forcing Treefern to repeat himself with additional words. His wife approved; this should help the native’s vocabulary.

They were never able to decide whether the new seeds were a deliberate attempt to capture their attention. Neither of the Treeferns believed that the natives could possibly have worked out that much about human psychology, especially in view of what their own minds turned out to be like. Nic, and even more Emi, were much less sure of this. In any case, either accidentally, incidentally, or deliberately, their attention was held while branches writhed out of the tangle to the tank and its tug and began to feel their way around and over the vehicle bodies, among wheels and treads, around emergency controls meant only for bugs and rescuers...

Both machines were enveloped in a loose, open cocoon of branches, some of them two or three centimeters thick, before anyone noticed. Again the question later was whether all *Annie's* windows being covered last was intentional or not. After all, the natives could have inferred the purpose of windows from their experience with *Jellyseal*.

Emi’s cry of surprise as he saw what was happening was followed by prompt startup and an effort to break out of the cocoon. Pam’s “Hold it!” preceded the guide’s voice by only a fraction of a second.

“Stop. Observing.” Emi stopped, less because he cared about obeying a nonhuman than because the brief effort had shown they were in no obvious danger; the branches were not nearly strong enough to fight fusion engines. Many of them had pulled apart, and the attention of the watchers was now held by seeing these rejoin the main tangle, not apparently caring where the joining occurred.

“Observing. Go later.” Pam spoke tentatively; the native seized on the new word.

“Observe. Go later.” Emi’s hands dropped from the controls, but his attention did not return to the gyrating dandelion seeds. Neither did Nic’s. Both wondered how much of this their wives had experienced—there was, after all, no telling *when* the communication link had broken.

It must have been farther Hotnorth, both realized. They had talked to their wives often, of course, and there had been descriptions of landscape with the sun almost above the horizon. The women had wondered why clouds seemed to be as numerous, large, and dense as ever in spite of the rising temperature. Not even Dominic had risked a guess at the time.

“They’re hijackers! They’re playing with emergency drain valves!” Akmet, who had deployed a bug and was using its eye, cried suddenly.

“They’ll be sorry,” answered Emi dryly. “Get your bug ready to close anything they open.”

“Will it—they—whatever—let me close enough?”

“They won’t be able to stop you, I’d guess. But I’ll be ready to roll if we have to.”

Pam uttered just one word, for the benefit of their guide. “Danger!”

There was no answer at once; perhaps the native had been unable to untangle her word from the two men’s transmissions. Pam waited a few seconds before repeating her warning. Still no answer from outside, or the city ahead, or wherever the messages were originating.

“Those things are being controlled by the natives, the way the stuff that drove *Jelly* was!” exclaimed Emi. Nic had an even wilder idea, but kept it to himself for the moment. For one reason, it seemed silly.

A set of millimeter-thick tendrils had been concentrating on one relief valve. There was no instrument to tell the crew how much force was being applied, and the cock itself was safetied to prevent its being turned accidentally. The four people watched the bug’s monitor screen in fascination as the cotter pin was straightened, worked free, and dropped to the ground.

The tendrils played further with the valve, and found almost at once which way it would move. The paraffin was not entirely melted yet, though the temperature had been rising; but there was quite enough liquid just inside the wall to find its way through the opening. The watchers saw a drop, and then several more, emerge and almost at once disappear as vapor.

The results were not surprising. Pam controlled herself with no trouble—it was not yet clear whether sympathy was in order—and made sure the new word was understood.

“Danger! Danger!”

The association should have been clear enough. There was no flame at first, but the hydrocarbon produced volumes of grey and black smoke. It was anyone’s guess what compounds, from hydrogen fluoride on up, were being made. Within seconds the branches immersed in them appeared to stiffen; at least they ceased moving. Their colors changed spectacularly. No one had seen bright green, yellow, or orange on Halfbaked until now. The branches that turned yellow did flame a moment later and also went off in smoke, leaving no visible ash. None of the watchers was a chemist; none tried to guess what might be forming. Akmet did his best to paint a verbal picture for the listeners at Nest, but this was not detailed enough for an analysis.

There was no objection, from inside or out, when Emi jerked the tug into motion and pulled away from the site. The bug stayed, but two of the witnesses preferred to use the windows with their broader field of view. Wind was spreading and diluting the smoke, but the stuff was still deadly; fully a quarter of the copse was now visibly affected.

“Hydrogen compounds. Danger.” Pam knew the natives had the first word already in memory, and took the opportunity to add “compounds,” which might not be.

Exchange Rate

"Are you after my job?" came Tricia's voice, with no tone of resentment.

"Just grabbing opportunity while I can see what's happening."

"**Hydrogen compounds. Danger. Observed.**" The native was starting to handle tenses.

"I guess they grow machinery the way we do. I wonder how much time and material that test cost them," remarked Ermi. Nic once again made no comment, possibly because there was no time; their guide resumed instructions almost at once.

"**Observed. Go.**"

"Which way?" asked Ermi. There was no answer until Pam tried.

"Right? Straight? Left?" The first and last words were known; the middle one might be inferred from context. Perhaps it was, perhaps the native was testing it.

"**Straight.**"

Ermi obeyed. At the moment *Annie* was heading thirty degrees or so west of Hotnorth, the sun ahead and to their right. They had gone about half a kilometer when the command "**Right**" came. Ermi altered heading about five degrees, and received a repeat order as he straightened out. This kept on until they were once more heading almost at the tiny visible slice of sun.

Once convinced they had the direction right, Pam asked "How far?"

"**Five thousand three hundred twenty-two kilometers.**"

No one spoke, either in the tug or back at Nest. Senatsu had no need to point out that the distance and direction corresponded to the source of *Jellyseal's* last communication, as well as the native transmissions. Halfbaked seemed much too large for this to be coincidence. They drove on, but the hours were now less boring.

Nothing changed significantly except for the slow rising of the sun ahead of them. Patches of plant life were sometimes numerous, sometimes cactuslike, sometimes absent. Clouds varied at least as much. The ever-flickering lightning was less obvious in sunlight, but didn't seem actually to be decreasing. Quakes made themselves felt, and sometimes forced changes in route not foreseen either by Senatsu or their native guide. Wind alternately roared and whispered, mostly from behind but sometimes gusting from other random directions violently enough for the driver to feel. Ermi and Nic, with more experience than the others, wondered aloud what the return might be like with a much lighter tank in tow. The thought of having it blown from their control was unpleasant. So was the idea of ballasting it with some local liquid which might freeze before they reached Nest. The advisability of abandoning the tank was considered, both among the crew and with Ben; it would, after all, be small loss.

The problem was tabled until the situation actually had to be faced, with some silent reservations in Nic's mind. He was uneasy about waiting until decision was forced on them by experience, who sometimes starts her courses with the final exam.

The Hotnorth route became no straighter as the sun rose higher. It became evident that the distance estimated by their guide had not included necessary detours. Whenever Tricia or Pam asked how far they had yet to go, the answer was larger than that obtained by subtracting the current odometer reading from the last advice.

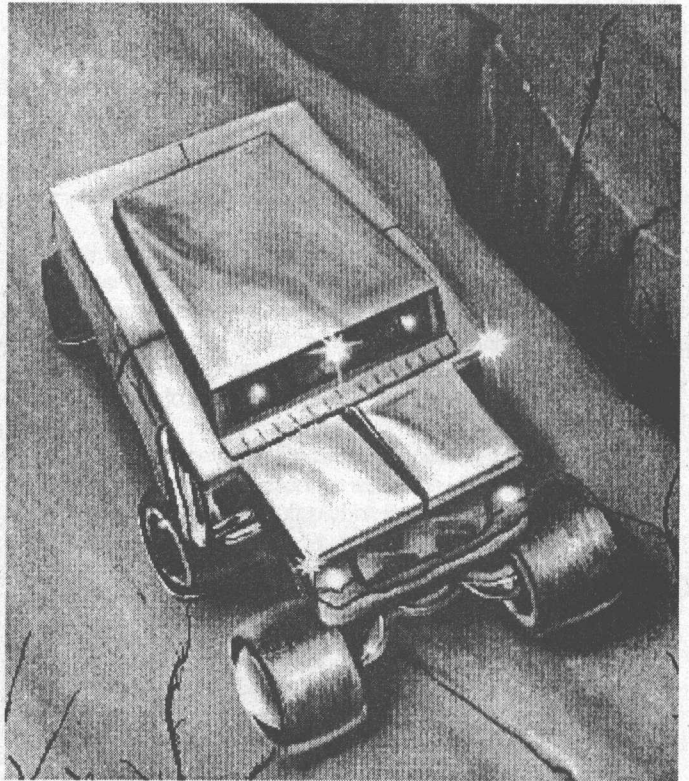
This of course made it more obvious than ever that the goal their guide meant was indeed the "city" where the women, as not even their husbands doubted now, must have died.

This fact alone was enough to relieve the boredom; everyone, driving or not, remained alert for new and different phenomena. However likely it might be that it had occurred while unloading, the fact remained that something unforeseen had happened. This is no surprise in the exploration business, and explorers are strongly motivated to collect facts which may assist foresight.

And, if at all possible, to make sense of them.

Time stretched on. The four were in no danger as far as food, oxygen, water, and waste disposal were concerned—there was no shortage of energy. Nevertheless, conversation began to deal more and more often with the next drying-out session, which would include bathing facilities under one gravity. The tiny imperfections in recycling equipment were making themselves felt.

It was known from *Jellyseal's* reports that the last two thousand or so kilometers had been on fairly level ground where high speeds were reasonably safe. It was also known that this fact could change quickly on a world with county-sized tectonic plates. Luckily, the warning that it *had* changed came early. The original *Quarterback* crew had experienced it before, but this time the deep-lights were no help. With the sun up and ahead of them, these were not in use. Only the increasing intensity of the temblors gave a clue to what was happening. Nic, who was driving when he recognized it, slowed abruptly.



"Send a bug out ahead!" he ordered to no one in particular. "I think we're near another epicenter!"

"Maybe it's behind us," suggested the woman.

"Maybe it is, and maybe to one side or the other, but I'd rather not take even a twenty-five percent chance of going over a half-meter ledge. If ground is rising ahead okay, we'll see it in time; but I wouldn't guarantee to spot a drop even with all four of us watching."

All four were, but it was Akmet guiding a servobug who located the active fault, and issued the warning which brought *Candlegrease* to a firm halt.

An immediate question came from their guide, who seemed to have them under constant observation even though they had never located him, her, it, or them. Communication had improved a great deal in the last few weeks as the native(s) had joined increasingly in conversations between the vehicle and Nest.

"Why stop now?"

Absolute Magnitude

"Danger. Scarp here. Watch." Pam turned to her husband. "Drive the bug over the edge, so they can see what happens."

Akmet obeyed, with spectacular results; the drop was a full meter and a half.

"No hydrogen in the bug?"

"Right. Bug smashed. Lots of—much—hydrogen in *Candlegrease*, and *Candlegrease* would smash worse. You want hydrogen, but not here."

"Right."

"We need to pass the scarp without smashing *Candlegrease*. How far must we go, and which way?"

"How high the scarp for no danger?"

"About fifteen centimeters."

"About unclear."

"Not exact. Don't know exactly. That should be safe."

"Left forty-five kilometers to ten centimeter scarp. Right twenty-seven. About."

"We'll go right—wait."

Ben's voice had cut in. "You have seismic thumpers in the bug hold. How about trying to flatten the slope? It might save time."

Emi brightened visibly. "Worth trying. We wouldn't even have to waste bugs. Three or four sets of shots should tell us whether it'll work or not."

Pam said tersely to their guide, "Wait. Observe."

"Waiting."

Actually, it didn't wait. Emi was the first to notice; Nic and Pam were deploying bugs, and Akmet was occupied at the communicator adding details to the description of their surroundings—anything which might help Senetsu in her interpretation of radar and other microwave observations was more than welcome at Nest. Emi alone was looking through a window when one of the blackish blowing objects again made itself noticeable.

It was far larger than the general run of jetsam to which everyone had gotten accustomed. This one had not been noticed before because, as they now realized, it had been riding far higher than the rest of the material, high enough so that only careful study would have revealed its shape. Now it came down abruptly, in a sort of fluttering swoop, and hung a few meters above the wreckage of the bug in a wavering hover. They knew now that they had seen it, or something like it, before.

It had surprisingly slender wings, whose span Emi estimated as fully ten meters, and which bent alarmingly in the turbulence of the heavy atmosphere. They supported a cucumber-shaped body a meter and a half in length, with a three-meter tail projecting from what was presumably its rear. The tail was terminated by conventional empennage for aircraft, vertical and horizontal stabilizers, rudder and elevators. Emi's warning cry called the others' attention to the arrival, and the bugs stopped moving as their operators looked.

"A glider!" exclaimed Akmet. "In this gravity?"

"Think of the atmosphere," pointed out Dominic.

"I'm thinking strength of materials," was the dry rejoinder.

"I suppose that's where they've been watching us from," Pam added thoughtfully. "It gives us some idea of their size, anyway. I wonder how many it's carrying."

"Or whether it's remote controlled like *Jelly*," Nic pointed out. Pam admitted she hadn't thought of that.

"No windows or lenses," Emi submitted.

"Those wings seem to have very complex frameworks. They could also be microwave and/or radar antennae," was Akmet's remark, reminding the rest that conclusions were still premature and providing the morally requisite alternative hypothesis.

"Let's not bury the bug; it seems to want to look it over. We'll shift fifty or sixty meters before we try to knock the cliff down." Emi acted on his own words, driving the *Annie* and dragging *Candlegrease* to the right as he spoke. No one objected. Three bugs followed with their loads of thumpers.

These were not simply packets of explosive; they were meant to be recoverable and reusable, though this was not always possible. They were hammerlike devices which did carry explosive charges, and were designed to transmit efficiently the jolt of the blast on their tops to the substrate. Ten of them were set up a meter apart and equally far from the cliff edge; a similar row was placed a meter farther back, and a third at a similar distance. The bugs then retreated—they were cheap, but there seemed no point in wanton waste—and the thumpers fired on one command.

No one expected the wave pattern they set up to be recognizable at Nest, thousands of kilometers away, through the endless seismic static, though the computers there were alerted for it. The desired result was a collapse of the cliff face, but no one noticed for several seconds whether this had happened or not. As the charges thundered, the wavering motion of the glider ceased and it dived violently out of sight, as far as anyone could tell almost onto the wreckage of the sacrificed bug. Pam saw it go, and cried out the news as the impact echoed the blast.

"Watch out with the next shot! We don't want to bury it!"

It was clear enough there would have to be a next shot, quite possibly several. The face of the scarp had collapsed in satisfactory fashion, but the slope of rubble was still far too steep for safety. This, however, was not what surprised the four.

"Bury still unclear."

Pam recovered almost at once. Either they were being observed from somewhere else, or the occupant of the glider had not been disabled by what should have been a seven-gravity crash, or—

Nic's own idea was gaining weight. So was Emi's.

"Observe new rock. Wait." The woman's answer to the native was prompt, and even Emi saw what she meant.

"Observing. Waiting."

"Set up the next shot, boys."

The cliff had crumbled for a width of some twenty-five meters, to a distance varying from ten to fifteen meters back from its original lip. On the second shot the distance back more than doubled.

"New rock buried," Pam announced without bothering to look.

"Bury clear."

A third set of thumpers, skillfully placed, kept the twenty-five meter width nearly unchanged and practically doubled the other dimension. A fourth, with *Annie* and *Candlegrease* moved farther back for safety, left a promising if still rather frightening slope.

Akmet, using the largest and heaviest of the available bugs, traversed this down, up, and down again, without starting any slides. Dominic repeated the test for practice. Then, with no argument from anyone, he turned back to *Annie*'s controls and very gingerly drove tug and tow down the same way. Everyone thought of trying this with the tow disconnected first, but no one mentioned the idea aloud. Emi wanted to get it over with, the others simply trusted Nic's judgement.

At the bottom, *Candlegrease* safely clear of the rubble, the tug stopped and everyone went to the left windows.

The glider's remains could now be seen easily. The body was flattened and cracked, the wings crumpled, the empennage separated from the rest. A patch of growing stems, twigs, and branches had already started to grow from, around, and through the wreckage, and after a few moments Emi brought them closer. Akmet was once again relaying descriptions to Nest. They were given little time to report.

"Go. No stop needed."

Exchange Rate

"Right? Straight? Left?" asked Pam.

"**Straight.**" They were at the moment facing about Hotnorthwest. Emi, still at the controls, obeyed. After they had gone about fifty meters, "**Right.**" He started to swerve, and Pam muttered softly, "Full circle." He obeyed, guessing at her plan, and kept turning after they were heading sunward and the voice expostulated "**Stop Right.**" Back at the original heading, the woman said simply, "Three hundred sixty degrees." It worked; the next message was "**Forty degrees right.**" He obeyed, and received a "**Four degrees right.**" In minutes the wrecked glider and the growth around it were out of sight.

They were now looking at the sky more often and more carefully. At least two more objects among or beyond the usual foreground of blackish jetsam, objects which *might* be other gliders, could now be seen. No one was surprised when an occasional "**Left**" or "**Right**" warned them of other obstacles, sometimes but not always before Senatsu provided the same information. The natives by now seemed to have a pretty good idea of what the human-driven vehicles could and could not do—or get away with. The tug and its tow sometimes had to be guided around a fair-sized boulder which had not been mentioned, but nothing really dangerous went unreported.

"I guess they really want us to get there," Akmet remarked at one point, rather rhetorically.

"They want their hydrogen to get there," retorted Emi. "It will. Don't worry."

"And you don't think they care that much about us?" asked Pam.

"What do you think?" The woman shrugged, her wet suit doing nothing to conceal the motion. She said nothing.

"What do you think of *them*, Emi?" asked Nic. He was driving and didn't look away from his window.

Icewall didn't even shrug. As usual, not much of anyone's face could be seen, but Pam gave an uneasy glance toward her husband. He answered with a barely visible raised eyebrow. It was at least a minute before anyone spoke.

Then, "They care about as much for us as for one of their branches," Emi said flatly.

Nic nodded, his body attitude showing some surprise. "You've got it after all. You had me worried," he said. This time his friend did shrug visibly. Rather unfortunately, no one chose to prolong the discussion. More time passed.

They were now really close to their goal, according to their guide—"three hundred forty-four" was its terse response to the question.

"Any more danger?" asked Pam. "Go fast?"

"**No more danger. Go fast.**"

The driver, currently Akmet, started to add power, but after a mere twenty-kph increase Nic and Emi almost simultaneously laid hands on his shoulders. The former spoke.

"That's enough for now."

"Why?"

"Somewhere along here something happened."

"That wasn't until they got there?"

"As far as we know. Don't overdrive your reflexes. Keep your eyes wide open."

"**No danger fast.**"

Emi answered. "Observing." This seemed to be an unimpeachable excuse. There was no further comment from their guides and watchers. Anyone who had hoped or expected that they would betray impatience was disappointed.

There were now six or seven of the gliders in sight most of the time. Their irregular motion made them hard to count. Pam was almost certain she had seen one struck by lightning a day before, but her question at the

time—"Danger for you? Lightning?"—had gone unanswered. Since there were two new words in the sentence this might have been lack of understanding, but always before such lack had been signified with the "Unclear" phrase.

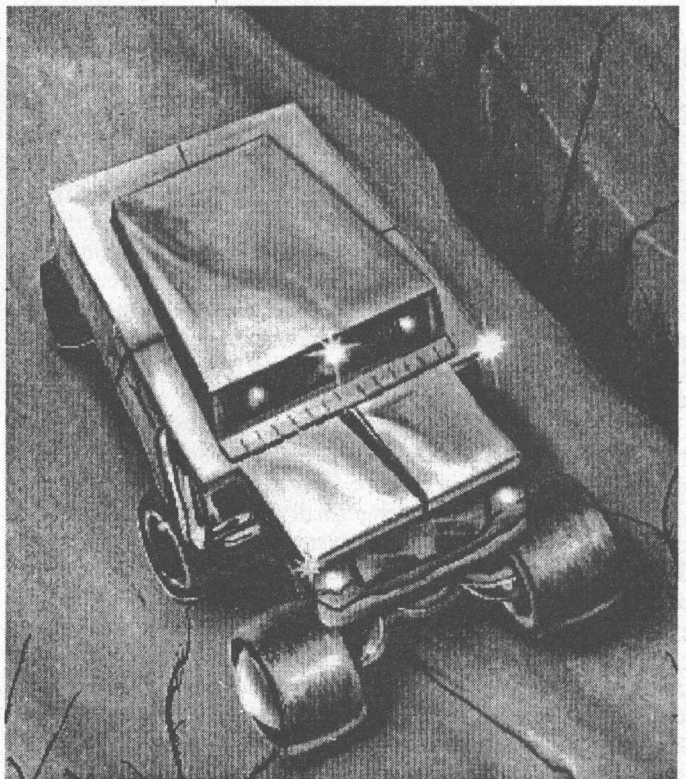
Human tension was mounting, not only in the tug but at Nest, where Ben and the others were being kept up to date by nearly continuous verbal reports.

The sun was causing less trouble now for the driver. It was still partly below the horizon ahead, but there were more and more clouds; and those near the distant horizon provided a nearly complete block even when only a small fraction of the sky overhead was actually covered. What the clouds failed to hide was largely behind blowing dust and other objects.

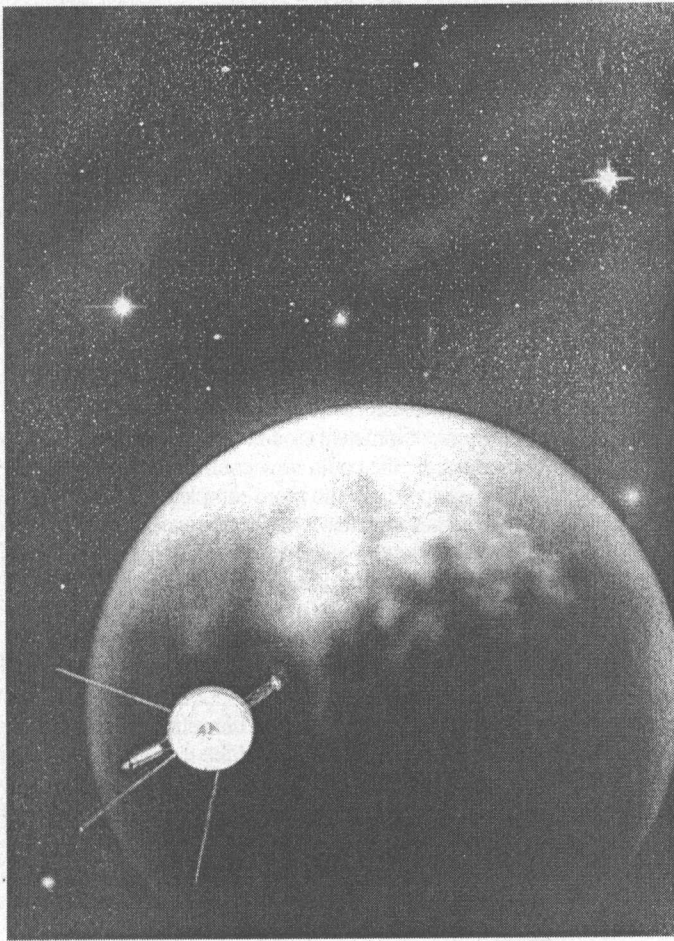
Mountains seemed much rarer, though no one assumed this a function of Hotlat alone. Senatsu assured them it was not, that only the two or three million square kilometers around and ahead of them were any smoother than average. She could now confirm the native-given distance to the "city," but could give no more complete a description of it than before. She was certain now that it was beside one of the lakes, but had no data whatever on the nature of the fluid this held. Chemists were waiting impatiently for news on that point.

Senatsu had triumphantly reported resolving the area where the travelers had descended the cliff, and even getting an image of the thicket where the glider had crashed; but this, she said, had not grown more than a meter or two from the wreck. This made no sense to anyone but Nic, who still kept his developing ideas to himself.

The glider count continued to grow. So did the number of crashes. Several times these events were seen from *Annie*, but more often wreckage was sighted to one side or the other of their track. Experience gave the human observers a way to estimate when the wrecks had occurred; it seemed that the plants which represented the remote control mechanism grew uncontrolled for a short time, then died for lack of—something. The natives had clearly not completely mastered aviation, but seemed casual about its dangers.



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A clue to the nature of the something was secured when they passed an apparently thriving thicket of the stuff at the edge of a small lake. The evidence was not completely convincing, since no trace of a wrecked flying machine could be seen in the tangle. The distant chemists at Nest were more convinced of the implication than the four on *Annie*; it was, after all almost dogma among biochemists that life needed liquid; it was a solution-chemistry phenomenon—though the precise solvent seemed less important.

At the present general temperature around *Annie*, it could easily be the cryolite found on *Jellyseal*. Numerous bets were on hold at Nest. Bugs went out from *Annie* to collect samples from the lake, but there was no means of analyzing these on board. There had been a limit to the equipment the tug could carry, no matter how many enthusiasts were involved in the design.

The missing women had been better equipped in this respect, but had apparently postponed sampling until after their cargo was delivered. They had never reported any collecting.

The lightning, even among small clouds, was now almost continuous. Thunder and even wind could be heard most of the time. The crash of one glider was near enough to be audible inside the tug; and of course the rain, frequently materializing with no obvious cloud as a source, could hardly be missed as it drummed on the vehicle's shell. Most of the liquid that struck the ground vanished almost instantly; no one could be sure whether it was evaporating from the hot surface or soaking into it even when an experimental hole was dug by one of the bugs. The explorers paused—bringing questions from their guides—to watch for results, but these were

inconclusive. Whatever was happening was too quick to permit a decision. Pam made an effort to ask the natives, but it was hard to decide afterward whether the questions or the answers were less clear. Tricia, back at Nest, brightened up when this happened and got to work with her computer, but even she remained unsure of what had been said.

At last the welcome **“one kilometer”** sounded, followed a few seconds later by **“up slope ahead.”**

There was indeed a slope ahead, only a few meters high but quite enough to hide what lay beyond. Tug and tank labored up to its crest, and were promptly stopped by Pam. Her husband resumed reporting.

“There’s a roughly oval valley below us, with a lake like the one where they tested the paraffin but a lot larger. Sen was right; the lake is about three quarters surrounded by a thicket of the same sort of plants we saw there, and its Hotsouth end is dammed in the same way. There are several low, round hills scattered over the valley. The two closest to the lake are covered with the bushes; all the others are bare. Between the two covered ones is another bare but differently colored space extending a kilometer or so toward the bushes and lake. The overgrown area covers about five by seven kilometers. It borders the Hotnorth side of the lake, which is oval and about three kilometers by two, the long measure running Hotnorth-Hotsouth. In the bare section, directly between the two covered hills is something like a wrecked building about a hundred meters square. I can’t guess how high it may have been. Another at the Hoteast edge of the lake seems intact, has about the same area though it isn’t quite so perfectly square, and has an intact flat roof. It’s about fifteen meters high. They’re talking again; you can hear them, I suppose. They seem to want us to—Erni, what’s up?” Akmet fell silent.

“Something wrong?” asked Ben, while the rest of Nest stopped whatever it was doing.

“You’ll see.” It was Icewall’s voice. He had gently but firmly sent Pam drifting away from the controls, and was guiding *Annie* toward the nearer of the overgrown hills.

“Thirty-four right” came from the speaker. Again. And again. *Candlegrease* continued straight toward the eminence. Pam managed to silence the native with a rather dishonest **“Observing.”**

Tug and tank descended the valley, crossed the bare part to the nearer overgrown hill, climbed it, and came to a halt looking down on what Akmet had described as a wrecked building. From three kilometers closer, there seemed still no better way to describe it.

The other three cried out together as Erni did a quick-stop. Then, donning a waldo, he deployed one of the smallest bugs and sent it back toward *Candlegrease* on the side toward the lake.

Nic, knowing his partner best and far more experienced with the equipment than the other couple, imitated Icewall’s action; but there was no way he could make his bug catch up with the one which had started first. Erni’s mechanical servant took hold of the still unsafetied relief valve which had destroyed the other patch so far back, in the natives’ grim experiment.

“Hold it, Erni! What do you think you’re up to?” The question came in three different voices, with the words slightly different in each, but was understood even at Nest.

“Don’t ask silly questions—or don’t you care about Maria?”

Nic’s lips tightened invisibly behind his breathing mask.

“I care a lot, and so will the kids when they hear. But that’s no answer.”

Pam was broadcasting deliberately as she cut in; she was uncertain how much the natives would understand, but it seemed worth trying. “You just want to kill a few thousand of these people to get even?”

Exchange Rate

"Don't be stupid. I won't be killing anyone. This isn't a city, it's one creature. I can punish it—hurt it—without killing it. I can teach it to be careful. You know that, don't you, Nic?"

"I'm pretty sure of it, yes. I'm not sure releasing the paraffin up here won't kill it completely. We're at about the highest point in the valley, much of our juice is denser than the local air, and the wind is random as usual. If we do kill it, it may not be a lesson. We don't know that there are any more of these beings on the planet. We certainly haven't heard from any, and the satellites this one spotted and began talking to can be seen from anywhere on Halfbaked. Think that one over. All the intelligence of a world for two human lives?"

Erni was silent for several seconds, but his servo remained motionless. At last, "You don't know that. You can't be sure."

"Of course I can't. But it's a plausible idea, like the one that this is a single being. Anything I can do to keep you from taking the chance, I'll do. Think it over."

Pam disapproved of what sounded to her like a threat.

"Why are you blaming these people, or this person, whichever it is, anyway? You don't know what happened is their fault."

"They weren't careful enough! Look at that wrecked building there! That's got to be where it happened—"

"And the dead-vegetation area downslope from it! Maybe they weren't careful enough—how could they have been? What do they know about hydrogen compounds? What do *we* know about their behavior here, except what *they* found out and showed us a while ago, long after the girls were gone? What—"

"I don't care what! All I can think about is Jessi! What she was like—what she *was*—and that I'll never see her or feel her again. Someone's got to learn!"

"You mean someone's got to pay, don't you?"

"All right, someone's got to pay! And what do you think you can do to stop it, Dominic Wildbear Yucca, who is so disgustingly civilized he doesn't care for the memory of the mother of his kids!"

"Who is so disgustingly civilized he doesn't want to admit to his kids, and his friends, that he didn't try to keep a good friend from—"

"Friend! how can you call yourself a—"

"You'll see."

"How?"

What Nic would have said in answer is still unknown; he refused to tell anyone later. Pam cut in again.

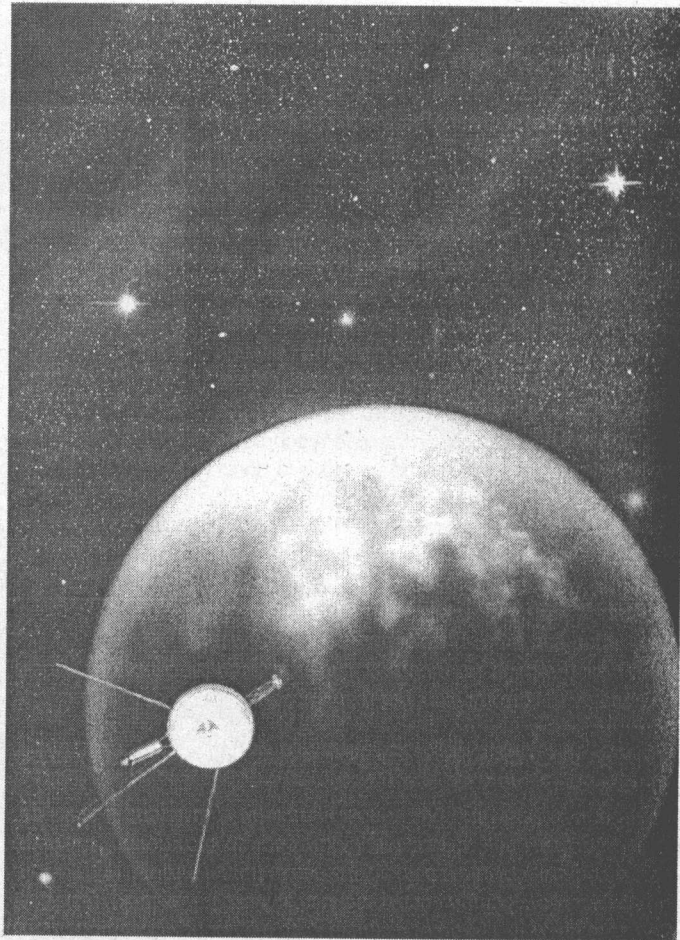
"Look! Isn't it enough to scare them—scare it? Look what's happening!" Look at the city, or the creature, or whatever it is!"

Even Erni took his eyes from the screen of his servobug. For the first and only time since the native's hydrocarbon experiment, they clearly saw the dandelion seeds. Hordes of them, rocketing up from every part of the overgrown area, catching the swirling, wandering winds, many falling back to the ground close to their launch points, but some being carried up and away in every direction.

The woman saw Erni's distraction, and pressed home her argument. "They want to save what they can! Those things really *are* seeds. They scatter them when the parent is in danger, or knows it's dying!"

"You—you don't know that either." Erni sounded almost subdued, and certainly far less frenzied than a few seconds earlier. Nic began to hope, and waited for Pam to go on.

Erni's attention now was clearly on the scenery rather than his bug. Even though his still had his hands in the waldos, there was a very good chance that Dominic's bug could knock the other away from the valve in time.



Nic took what seemed to him a better chance by passing up the opportunity. Pam was silent, so he finally spoke softly.

"I can forgive your cracks about my not caring, because I do care and know how you feel. But what you want to do is just the same sort of angry, thoughtless thing as those words, isn't it?"

Erni's answer seemed irrelevant.

"If it's scared, why doesn't it ask me to stop?"

"Using what words?" asked Pam softly.

"**Me unclear.**" The native utterance partly overlapped the woman's, and proved the most effective sentence of the argument.

Slowly, Erni drew his hands from the waldo gloves, and gestured Akmet to take over the bug's control.

"Better try to get 'we' across while you're at it, Pam," was all he said. He let himself drift away from controls and window.

"**Me and we unclear. One at a time.**"

Pam might have been smiling behind her mask. She did look hesitantly at her companions, especially Erni. Then she tried her explanation. Numbers, after all, had long been in the common vocabulary.

"Observe *Annie* closely. Me, one animal. We, more than one animal. Four animals in *Annie*."

Erni made no objection, but added quietly, "No valve danger. Which way?"

"**Right.**" Erni, now thoroughly embarrassed, glanced around at the others as though asking whether they really trusted him to drive. The other men were concentrating on the bugs outside, the woman

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seemed to be watching the putative seeds. They were mostly settled back to the ground or blown out of sight by now. No more were being launched, apparently. *Maybe* the suggested explanation had been right, but even its proponent was skeptical. Maybe they were some sort of weapon . . .

It soon became obvious that *Annie* was being led to the other shedlike structure. This one was at the edge of the lake but somewhat down slope from the overgrown areas. There seemed a likely reason, though not the only possible one, for this: care. No one suggested this aloud to the driver. It seemed too obvious that *Jellyseal* had, during unloading, wrecked the first building and killed much of the being or population which formed the copse.

As they followed instructions along the edge of the overgrown area, bunch after bunch of tangled branches waved close past *Annie*'s windows. Looking in? None of them doubted it. Pam continued alternately reporting and teaching, describing their path and surroundings to Nest and reacting to observations through the window with remarks like "One animal driving. One animal talking. Two animals moving bugs."

They were guided around the structure the lower side. This was open, and *Annie* was directed to enter. The far side, toward Hotnorth, could be seen to be open also, and though there was much growth within, there was plenty of room for tug and tank. Erni dragged his charge within.

"**Stop.**" Since there was an opening in front, he obeyed, though he remained alert. The bugs operated by Akmet and Nic had come in too, and all four explorers watched, not without an occasional glance forward, as the doorway behind was plugged more and more tightly by growing branches and finally, as nearly as either bug could see, became airtight.

"**Carbon hydride stop.**" Reading between the words, the bug handlers detached *Candlegrease*. Erni eased *Annie* forward. Three things started to happen at once, all interesting for different reasons.

Flattened bladders appeared among the branches and were borne toward *Candlegrease*'s valves. Apparently the paraffin was not to be exposed to local air this time.

A wall of tangled growth began to form between *Annie* and her tow, without waiting for the bugs to get back to the tug. Nic and Akmet, after a quick but silent look at each other, abandoned the machines; there were plenty more, and there seemed no objection to their being "observed" at leisure by the natives.

The doorway ahead began to fill with a similar block. This also caused human reaction. Erni sent the tug grinding firmly forward.

"**Oxygen hydride stop.**"

No attention was paid to this. In a few seconds *Annie* was outside, with a patch of torn and flattened vegetation behind where the growing wall had been.

"**Water stop.**"

Pam remained calm, and Erni did not stop until they were a hundred meters from the lab, as they all now thought of it. Pam explained.

"Water stop danger for animals."

The native voice did not respond at once, and after some seconds Cloud's voice reached them from Nest.

"Y'know, Pam dear, I think you've just faced your friend outside with the problem of what an individual is. Don't be surprised if you have to restate that one."

The woman answered promptly and professionally.

"You mean my friend or friends. You're hypothesizing still. Let's call this one Abby, and start looking around for Bill—"

"**Water next time,**"

"Water next time," she agreed.

"All right, it's—they're—she's civilized," muttered Erni after a moment.

"Of course. So are you," answered Dominic. All three looked at him sharply, but he ignored the couple.

"You wouldn't really have turned that valve, would you?"

The younger man was silent for several seconds. "I don't think so," he said at last.

"We didn't really talk you out of it, did we?"

"I guess not. That's the funny part. Once I was where I *could* do it, I—I don't know; I guess having the power, knowing I was in charge and no one could stop me—well, that was enough." He paused. "I think. Then the arguments distracted me, and I realized you'd sneaked your bug close enough so you probably *could* have stopped me. And I didn't care that you could.

"Nic, I'll help you tell the kids, if you'll tell me why getting even can seem so important."

"We'd better tell them that, too. If we can figure it out. Y'know, I'm not sure I *would*'ve stopped you."

The Treeferns listened sympathetically, and since they were also human not even Pam thought to

ask why *Jellyseal*'s failure was the natives' fault.

