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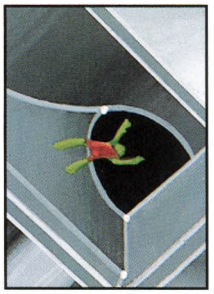

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NONFICTION

LOOKING FORWARD

Cover Art by David Martin

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Chicon on My Mind

Kim Mohan

A couple of weeks after I finish writing this, I'll be off to Chicago for the 49th World Science Fiction Convention, otherwise known as Chicon V.

It may be someone else's 49th, or 25th, or 10th, or 5th . . . but it will be *my* first. And I haven't been able to get it off my mind for quite a while now.

I don't have any idea what I should expect, but that hasn't kept me from forming some preconceptions about what I hope will happen, what I'm afraid will happen, and what I wouldn't be surprised to see happen. At the cost of possibly embarrassing myself in print (for what wouldn't be the first time), I decided to put some of my preconceptions on record. Then, the next time I have a blank page 4 in front of me—after the convention—we'll see how closely my experiences matched my expectations.

I expect to see a lot of people—which I guess would be impossible not to do, unless I lock myself in my hotel room for five days. More specifically, I want to meet and talk to some of the writers and artists who have helped the new version of this magazine succeed. The least I can do is look them up and express my gratitude in person. (Actually, the *least* I could do would be not to pay them . . . but that's not an option.)

And I want to get face to face with a other professionals and try to talk them into being contributors for future issues. (Yes, I have a wish list, but that's going to stay classified.) I'll be taking along mass quantities of last month's magazine and politely shoving them into the hands of authors and illustrators who might not be familiar with what we're doing. If AMAZING® Stories is not a household name by the end of the convention, it won't be for my lack of trying.

I expect to take in a lot of program events—seminars, panel discussions, exhibits. I want to get educated more than I want to be entertained, which is why I'll probably skip stuff like the Masquerade, showings of films and videos, and anything that takes place outside the walls of the hotel where the convention is held. Fun, for me, is listening to other people talk about their areas of expertise, in the hope that some of that knowledge will rub off.

There are quite a few advantages to working out of an office in southern Wisconsin instead of being located on either coast—for one thing, I don't have to leave the ground to get to this convention—but one thing I've always missed is the person-to-person exchange of ideas and information that I imagine goes on in places such as New York City, Los Angeles, and Eugene. At Chicon, I'll have a chance to openly eavesdrop on conversations and monologues about "_____ in Science Fiction Today." I will carry a tape recorder, and I will take notes; this convention is going to be a learning experience for me, and I intend to treat it like one.

And I expect to have some unstructured fun, too. I've already given and received enough lunch and dinner invites to get me through about three days' worth of meals. We'll connect on some of them; a few will fall through—to be replaced by rain checks for the next time we meet, I hope—and some other dates will be made on the spot.

"Fun," in the context of the above paragraph, is not the opposite of "work"—not when you have a job you enjoy. If someone wants to talk business with me over a meal, or over something a little less chewable, that's fine: business is what I'm there for. Business isn't always meant to be done via the mail or over the phone. For these five days, I'm going to do business face to face . . . and have fun at the same time.

I expect to get one more confirmation of my hotel reservation before I head for the big city—because ever since I registered, the hotel has sent a new confirmation slip about every two weeks. If this is the hotel's way of trying to reassure me that my room will be waiting for me . . . I'm not convinced. I've been burned too many times in the past: "Hmmm, we don't seem to have anything under that name. . . ." When they give me a key, and the key turns in the lock, *then* I'll know I've arrived. ✦

Reflections

Robert Silverberg

Not long ago, when doing research for a story that takes place in ancient Egypt at the time of the Eighteenth Dynasty, I found myself reading an anthology of fiction dating from that period. And at the end of one of the stories, a fantasy somewhat in the mode of the Arabian Nights called "The Tale of Two Brothers," I came upon this absolutely splendid curse directed against literary critics:

"Whoever speaks against this book, may Thoth challenge him to single combat."

How marvelous! How absolutely perfect! I think I'm going to use it as the last line of all my books from now on, and I recommend it to any of my fellow writers who may happen to be reading this that they do the same.

May Thoth challenge him to single combat! Way to go! The inscrutable, implacable ibis-headed god summoned from his heavenly duties to obliterate annoying book-reviewers with a single flick of his beady eyes! The final solution to the critic problem!

Not that I really have all that much animus against critics and criticism, mind you. Some of my best friends have written book reviews. I've written some myself. I even read some —the *New York Times Book Review* arrives in my house every week, and I look at the reviews in *The New Yorker*, and sometimes I even scan those in *Locus*. For the reader, reviews can be useful consumer guides, directing them toward books they'd enjoy reading and moving them away from things they probably wouldn't like.

But for the writer—

Oy vey, what they do to the writer!

Somebody—I wish I knew who—once said, "Critics are people who come on the battlefield after the fighting is over and shoot the wounded." Beautifully put, I think. Consider this:

The writer, having succeeded in negotiating all the preliminary pitfalls of proposing a book and obtaining a satisfactory contract for it, has been out there amidst the lightning and thunder for an interminable span of time, dancing nimbly about trying to put one coherent sentence after another while publishers, editors, friends and spouses if they've had a chance to peek at the manuscript, and sometimes even his own literary agent, all offer confusing and often contradictory advice. At last, after months or even years of *sturm und drang*, he shakily gathers up his bundle of manuscript and staggers down to the post office with it. The book is finished, or at least he's decided to stop working on it.

Off it goes to New York. Back come reams of suggestions for turning everything inside out. He explains to the editor why Chapter Five belongs where it is, instead of after Chapter Sixteen. Sometimes the editor gives in. Sometimes the writer does. The title is changed. The first hundred pages are cut, at editorial suggestion, to thirty pages. The protagonist's name is changed. The title is changed again. Eventually the book goes to the copy editor, who has her own strikingly individual ideas about the use of commas. The manuscript, as edited, goes back to the writer, who spends a couple of days erasing all the copy editor's changes. It is then set in type. The typesetter, a practitioner of stochastic garbling, introduces new and highly random alterations to the text. The writer repairs the damage. The book is printed. The book is published—with a painting on the cover showing a ghastly slimy *thing*, not to be found anywhere in the text.

And then, then, then, a horde of reviewers falls upon the book like devouring locusts, and each one proceeds to explain how it *should* have been written. No two ideas are the same. Six reviewers blame the writer because the cover painting doesn't jibe with the text. Three of them mock a typographical error that was introduced into the book *after* the writer last saw the galley proofs. Four find the author's beliefs politically unacceptable, two saying he's too conservative and the other two insisting he's too liberal. One suggests that the entire novel is a thinly disguised plagiarism of a famous work by Heinlein, Proust, or Danielle Steel.

". . . people who come on the battlefield after the fighting is over and shoot the wounded." Yes, indeed.

But the carnage isn't over when the horrible reviews are published.

Not in the slightest. Just as the writer's battered ego is beginning to heal, the writer's mother is on the phone. She's just seen some dastardly review of her child's book, months old, in a magazine in her dentist's office. How dare they! She'll send a letter to the editor at once! She wants to know the reviewer's address too! She quotes all the offending critical phrases in the process of refuting them. It takes half an hour to calm her down, and by that time all the wounds are bleeding again.

Or perhaps the writer hasn't even *seen* the unfavorable review, because he makes a point of not looking for them. It's a good bet, in that case, that some kindly colleague of his—usually an exact contemporary with his or her own fish to fry—will come up to him at a party and say, "I just wanted to tell you how sorry I am about the absolutely foul things they said about your book in the last issue of X Magazine. It's disgraceful, the way they trashed your book. I have to tell you that I haven't read the book yet myself, incidentally, but I know it can't possibly be as awful as they said it was." Someone will do that to you at least once a year, mark my words. Assassination in the guise of sympathy—an old, old ploy. Ben Jonson probably used it on Shakespeare.

You may think from what I've written so far that I must be inordinately sensitive to criticism, indeed am afraid of it, and that I have a morbid dislike of critics. Far from it. I've received plenty of bad reviews in my time—the law of averages alone would guarantee that, considering that I've published more books than I can count over a period of nearly four decades. *But I don't pay any attention to them whatever.* Generally I ignore the media where reviews are to be found. (The science-fiction world is particularly densely infested with magazines that review books. The only ones I receive are *Locus* and *Science Fiction Chronicle*, and I skim quickly through the reviews to get to the news columns.)

I began to cultivate this indifference to reviews in 1955, when my first novel, *Revolt on Alpha C,* was published. I wrote it when I was nineteen; I thought it was a pretty good book for a beginner, and so did my publisher. This is what the *New York Times* had to say about it back then:

"I find author Robert Silverberg's story too inept and unreal to warrant inclusion in such fast-moving company. [Heinlein and someone named Slater Brown.] Young Larry Stark, newly graduated Space Patrolman, lands with his crew on a planet of Alpha Centaurus, only to become embroiled in its rebellion against Terran control. When his best friends join the rebellion, Larry is forced into a series of old-hat adventures."

I could have let that review crush my soul, I guess. But I didn't need the *New York Times* to tell me that at nineteen I wasn't as good as Heinlein. I knew that already. I was aware of my book's flaws, but I wasn't skillful enough then to do anything about them; I hoped I'd improve; I was already at work on my next novel. Naturally I'd have preferred to have the *Times* say, "Heinlein, move over. Here comes Silverberg." But it didn't. So? I survived. The "inept and unreal" *Revolt on Alpha C,* by the way, remained in print, earning royalties, for the next thirty years.

To this day, if I happen to see a review of my book somewhere, I read it, shrug, and go on with what I'm doing. I have, after all, done the best job I possibly could with my book before releasing it for publication. I've planned it carefully, I've written it with thought, I've revised it over and over. If it still doesn't measure up to somebody's ideas of perfection, well, I'm sorry. But not very. Even the most searching piece of literary criticism won't help me write that book any better. The job is done; I'm already on to the next one. My faults are probably ingrained beyond eradication by outside suggestion, and my excellences, such as they are, will manifest themselves in the next book without the help of reviewers of the last one. So I don't care about the bad reviews. They slip from my mind. The favorable ones give me a nice buzz for five minutes or thereabouts; and then they slip from my mind too. David Frost once spoke of the only thing that any writer really wants from criticism: "Twelve pages of closely reasoned praise." Anything else is irrelevant.

Some writers, though, fail to achieve my detachment from criticism and suffer severe damage. Consider this case:

The June 1954 issue of a long-vanished s-f magazine called *Imagination* ran a review by one Henry Bott that had this to say of a newly published book: "----- ------ is an educated, articulate man, but he is neither a writer nor a storyteller. Heavy-handed and ponderous, ------ grinds out ream after ream of elephantine prose about his ridiculous 'Galactic Empire,' filled with endless philosophizing (on a juvenile level), obscure sociological fantasies, and massive technological monologues."

The unfortunate author of the book, learning to his dismay from Henry Bott that he was "neither a writer nor a storyteller," was so heartbroken that he gave up the profession of writing then and there. The book was called *Second Foundation.* The writer's name was Isaac Asimov. Who knows what fine work he might one day have managed to do, if Henry Bott's cruel review hadn't destroyed his career in its infancy? ✦

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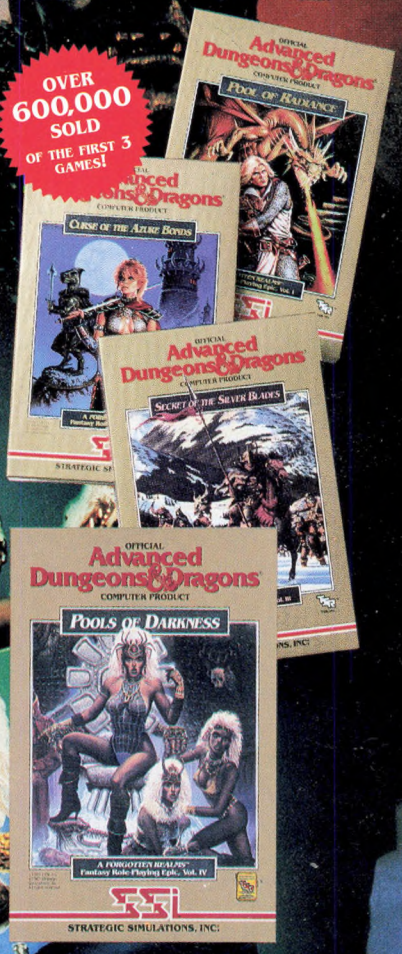

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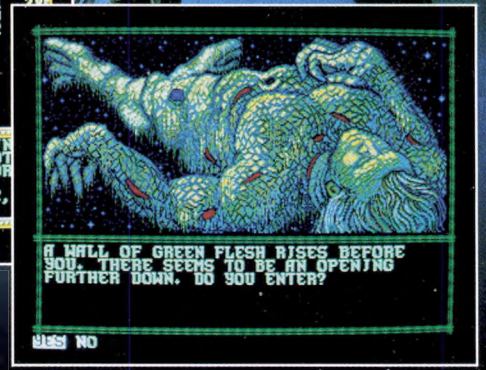

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Letters

Kim Mohan's editorial in the August issue, "That About Covers It," points out the banality of cover letters which spoil an editor's unbiased reading of a story. At the same time, he cites AMAZING's guidelines: "We want to get to know you as more than the name below the title."

It is misguided—and I hope only faddish—to insist cover letters accompany *fiction* submissions.

It makes perfect sense to explain one's background and interest in working up a nonfiction article. An editor needs to know a journalist's qualifications and point of view. Articles exist to inform, in a literal, unambiguous way, and there should be no secrets.

In contrast, fiction should rise and fall strictly on its own, literary merits. A letter can only harm the conceit of suspension of disbelief, can only hobble the elegant lie that is a story.

A self-revealing letter introducing a work of fiction is just the editorial handwringing that we're taught to recoil from in writing workshops. When required to write such a letter, I list what I've published. More than that, I look for a clever way to say I want to publish more.

One reason I write fiction is to adopt a fictional persona. The narrator in my short stories is never me, but just another fictional creation. I don't need anyone to know anything about the "real" me. I'd feel better if I knew an editor was reading my cover letter *after* reading my story. I'm delighted AMAZING's new format has moved all the bios to one place. From their former nest, perched like grade school nuns between story title and story, they were hard to escape.

I'm a gregarious guy. I crave to be chummy, personal—at least *known*. But not before my work has passed muster without fanfare.

Needless to say, I [will] always enclose a cover letter when submitting to AMAZING. "When in Rome . . ."

Bernard Rice
Park Forest IL

I appreciate the improvement in your stories, made within such a short time. You could clean up some of the language, still, it is measurably better. The stories are also improved. How you could have done so much so quickly is a marvel.

"Looking Forward" has a function I have never imagined: I have not read Anne McCaffrey or Piers Anthony since they used to write short stories. They have suffered from my early dislike of novel lengths made into serials. I have read a number of highly touted novels reviewed by several reviewers, mostly to my dismay. But now, in "Looking Forward" I can taste the writing, and I think you may convert me. I liked both of these, and I shall buy them.

W. F. Poynter
Santa Rosa CA

—

The new Amazing is vastly superior to the old one; while the new format is great, it's the quality of the stories that's most improved. I have a few specific comments about Issue Three.

"Shadow Album" is excellent! I gave it an A+ on my personal grading scale. (I take most of the major SF magazines, and find bloody few A+ stories.) It has an exotic alien setting, an innovative mcguffin (the all-absorbing fog), a theme (the costs and benefits of risktaking). But most of all, it has real characters; they even have a spiritual dimension. They even have a culture, a non-European-derived culture!

"Except My Life[3]" got a DNF instead of a grade. The superscripts went from funny to tedious to annoying long before the story went anywhere. (Not to mention the inconsistency that the four clones had distinct personalities, abilities and memories, so how could they all be the focal character—except as an excuse to use the superscripts?) In reference to your editorial "What We Want," I guess the story was purchased because it rated high on #3, (Nontraditional) Presentation. But all this story proves is that a clever presentation alone is not enough.

Regarding "Feel Good Stuff": was it too much trouble for the artist to draw a robin? Anyway, it was another A+ story. Reminded me of "Flowers for Algernon."

The other stories ranged from C ("Captain Theodule," "Perfect Hero") to A ("Holos").

Keep the "Looking Forward" department. The excerpts are often pretty good short stories themselves, and they provide guidance for the novel buyer that reviews can not. (For example, I *hated* the condensed English in *Grounded!* Good to know before investing five bucks for it.)

Jess Schilling
Huntingdon PA

—

My grandfather started reading Amazing Stories when it was first published. My mother practically learned how to read by it, and now here I am, the third generation picking up your magazine.

I think the stories are very good and varied. I like the book excerpts and especially the reviews. When I was younger I had time to read everything, and wasn't very discriminating. Now, I have to pick and choose and can't always keep up on who's writing what. Thanks for helping!

I believe that biographies of authors, personalities and pictures of said people would be fascinating. I'm not a film or video buff, so wouldn't be very interested in hearing about that media. Letters from readers can get bogged down, but can also be very interesting . . . depends on which letters are printed. (I can't stand nit-pickers.) I don't think that the editor's letter needs to be quite as long.

Bronwyn R. Richardson
Issaquah WA

SKIN DEEP

BRIAN STABLEFORD

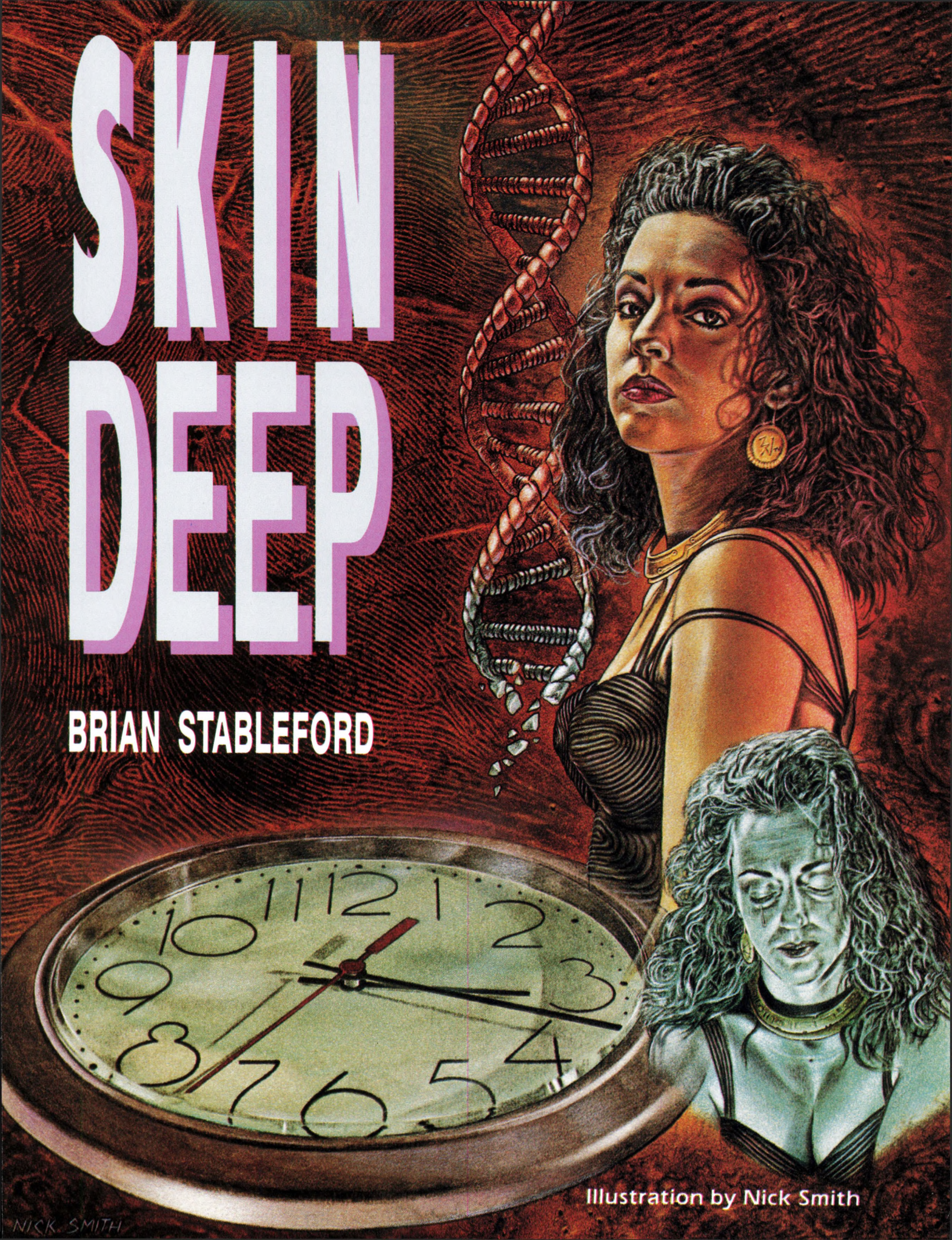


Illustration by Nick Smith

NICK SMITH

"You really don't have to go all the way, Piggy," said Melissa Sai gently. "No matter what the 3-V pundits say, total infatuation is simply not necessary."

"You don't understand, Missy," Orchisson complained, with more than a trace of bitterness in his voice, as he studied himself in the mirror. "I've had my fair share of media hype, and I'm not stupid enough to let it get to me the way some people do. There's really no need for you to be *utterly* cynical about emotional matters. You may have given up your finer feelings for Lent in 2349 and never got them back again, but that doesn't mean that no one in the whole world can ever fall in love."

Melissa looked down at her neatly crossed legs in order to hide her injured frown, and then made a show of surveying the delicate curve of her forearm. Roy had never talked to her this way before, and it wasn't just her pride that was hurt. She really was trying to help him, and she was disappointed by her inability to get through. There had been a time when he had listened to her, respecting her judgment—but that had been before he got his "fair share" of media hype.

She felt that she owed it to herself, if not to him, to put in one last plea for sanity. "It's a joke, Roy," she said. "Don't you see that? I won't even dignify it by calling it a myth. Sure, we all play along—it's a plug for the whole facetech business. But if I had ever thought that there was the slightest chance of your falling for that kind of crap, I'd never have started calling you Piggy."

"Actually, Missy," he said, turning away from the mirror at last, "I wish you wouldn't. Not in front of Helena, anyway. It's undignified. How do I look?"

He looked fine. Melissa didn't need a mirror to reassure her that her own face was just as flawless. She was, after all, in the business, and could get her looks wholesale. But hers was a very ordinary perfection; she was not a Work of Art with a capital W and a capital A. The biotechnician who had restructured her had been a first-class craftsman, but he had not been a Saul Steinhardt or a Roy Orchisson.

Whenever she was asked, Melissa always said that the reason she had never let her partner work on her own face was that she couldn't trust anyone else to take her place as his tissue-texturer, but that wasn't true. The reason she had never let him turn her into a Work of Art was that she had been in the business for a long time—she was forty years older than Orchisson—and she had long ago grown sick of all the 3-V babble about the Quest for Perfect Beauty and the Wisdom of the Loving Eye. She had seen too many would-be Pygmalions come to grief. Roy was the third featurist she had adopted and promoted, and she had nicknamed them all "Piggy" in the hope that she might immunize them against that kind of disease; but it hadn't worked with the other two, and now Roy had fallen for it too. Why, oh why, were first-time-young men so incredibly crass?

The fact that he had fallen for it at all was bad enough, but Roy wasn't a man to do things by halves. Instead of becoming besotted with some first-time-young ingenue, he had gone straight to the bottom of the barrel and fallen in love with Helena Wyngard. Helena was a third-time-young rejuvenate old enough to be his great-grandmother who had already had at least eight stabs at becoming the Most Beautiful Woman in the World in the tender care of other Piggies, and was arrogant enough to believe that she had succeeded every time.

"She's such a bitch," Melissa said, well aware of how feeble it sounded. "She's mad, bad, and dangerous to know. She'll chew you up and spit you out the way she does with all the idiots stupid enough to think they love her. Look at her track record. What do you think *you've* got that the other three thousand didn't have?"

She knew that she was leading with her chin, but she just couldn't help herself. The uppercut was duly delivered with merciless force and just sufficient accuracy to send her reeling. "If I didn't know you better, Missy," he said as the door-chime rang, "I could almost believe that you were jealous."

Melissa Sai was second-time-young, but she had never been in any other line than facetech. Such single-minded application to one kind of work was almost unheard of in modern times, but she had never been a respecter of fashions and trends. If other people wanted to spend their artificially extended lives collecting higher degrees and juggling three jobs at a time, that was their business; she was happy with constancy.

Once, when she was *very* first-time-young, she had considered going into medicine. That had been in an era when saving lives and repairing injuries seemed to be the proper function of tissue-restructuring techniques, and cosmetic restructuring was still widely regarded as a luxurious exercise of vanity. But she had realized, even before social attitudes underwent a general *bouleversement,* that such crude utilitarian thinking was out of date. The human race had passed through the historical phase in which technology served only as a defense against the cruel ravages of nature; all kinds of repair work and protection had been thoroughly routinized and could be taken for granted. The real work that was to be done no longer had to do with matters of health, but with matters of happiness. Death had lost its sting, old age had had its fangs drawn, and the task now at hand was to improve the business of living. So Melissa became an expert on facework, using her carefully cultivated geneswitching skills to recover the blastular innocence of the facial tissues, so that they could be remolded by artists.

She was not an artist herself, she was a technician; but without the support that technicians provided, artists could not work, and the greatest artists required the most expert geneswitchers to back them up.

Everyone was an art critic nowadays, and there were millions of people who thought that they could spot artistic talent, but Melissa knew better. Only an expert facetechnician could really identify a great featurist. She had worked with hundreds of artists in her time, but in recent times she had devoted herself entirely to her own discoveries. She had found them, trained them, promoted them, and lent her not inconsiderable influence to the building of their careers. She had not been sorry, in the end, to lose the first two to the Pygmalion Syndrome,

but Roy Orchisson was the best of the three, and she had dared to think that he might be different—that he might have the strength of mind to resist the outdated myth that represented love as a kind of madness.

The jealousy she felt was not sexual. She and Roy had romped a few times, like any other people of compatible tastes, but their relationship had never been polluted by infatuation. Nevertheless, she *was* jealous. Roy Orchisson was her protégé and her partner, and she did not want to see him hurt, humiliated, and played for a sucker by a woman who had made a career of acting out a silly myth fit only for the vidveg.

For the 3-V pundits, it wasn't enough that facetech was a way of making millions of ordinary people feel better about themselves; the 3-V thrived on hype, and in 3-V-ese, the heart and soul of facetech was The Quest for Perfect Beauty. Nor was it sufficient for Beauty to be pursued by calm and careful professionals exercising their skills; in the world of 3-V, Perfect Beauty had to be the product of Unbounded Love, and Magnificent Obsession, and the Ultimate Inspiration.

The vidveg had been fed the story of Helena Wyngard's personal Quest for Perfect Beauty for more than a hundred years, and the fact that she was now third-time-young seemed only to have increased the interest of her loyal public. According to the hype, of course, she had already succeeded in the Quest at least three times, but that had never made any difference to future expectations; according to the 3-V celebrity-brokers, facemakers were continually Pushing Back the Horizons of Beauty, constantly raising the standards of human perfection.

It was all rather pathetic. But the artists kept falling for it. The more media attention they got, the more they got sucked into the vortex. Eventually, they got talked into the belief that only the extremes of passion could inspire them to produce their finest work. And they started looking avidly about for someone to fall in love with—someone who might play Galatea to their Pygmalion.

It had always been inevitable, in spite of Melissa's hopes, that Roy Orchisson would eventually get his fingers burned just like all the rest. But she couldn't help feeling that insult had been added to injury by the fact that he had fallen head over heels for Helena Wyngard.

The door of the anteroom slid soundlessly aside to reveal the woman in question. She was followed into the room by her personal assistant, Wilson Schafran, a delicately effete third-time-young man whose perennial privilege it was to hover in the background while his employer strutted her stuff.

Even Melissa had to concede that Helena's present face was probably the best thing Saul Steinhardt had ever done. It hadn't yet begun to show any signs of wear and tear—it was only fifteen years old, and with proper maintenance it could have stayed on the road for another thirty years, even on a double rejuvenate like Helena Wyngard. But that wasn't Helena's way; Helena liked to have a new look just as soon as the old one began to seem over-familiar. The news that a new genius might be emerging among the ranks of the top-flight featurists was a magnet that infallibly drew her attention. She liked to catch her Pygmalions at exactly the right point in their careers. She liked to get the very best out of them—and then she would do her best to see that they never went one better. Had the law of the land offered her more tactical latitude, she would probably have had them murdered, but things being as they were, she contented herself with conscientious attempts at spiritual destruction.

"Roy, darling," she said, in a supersweet tone that only expertly retuned vocal cords could have produced, "it's so wonderful to see you again. And this must be Dr. Sai—such a pretty name, my dear. Roy has told me *so much* about you."

Orchisson bowed in an overly theatrical fashion, while Melissa contented herself with a very formal nod. When they all moved through to the inner sanctum in order to inspect the mock-ups on the big screen, Helena gravitated toward Orchisson, immediately reducing the distance between them to one that boasted of intimacy. This invasion of his personal space did not bother Roy in the least, and it was obvious that he had already granted her an exclusive territorial claim. Melissa, politely but carefully excluded, permitted herself a tiny sigh.

Melissa could see that any chance she might have had to make Roy see sense had already perished. Helena had already taken over. Roy must know perfectly well what had happened to all his predecessors, but the fact that Helena Wyngard was the ultimate *femme fatale* seemed to make her more attractive to those she lured and then attempted to destroy. The first victim of infatuation was always common sense; every new lover she took hoped and believed, in frank defiance of the calculus of probability, that *he* would not be as easily discarded as the rest.

Orchisson began to display his designs on the screen, delicately playing with line and tint, explaining the logic of his approach. He spoke rapidly but quite clearly, cleverly picking up the thread of some earlier discussion while Helena hastened him along with little nods and seductive upward glances shot from beneath slightly lowered eyelids. Melissa, momentarily lost in her study of their body language, had to make an effort to tune in.

". . . It's not contrast for contrast's sake, of course," Roy was saying, with the casual ease of a showman who has mastered his patter, "nor is it a mere matter of fashion—I aim to make the trends, not follow them. But the ivory-complected ash-blonde look is so classically *severe* and symmetrical that it has come to seem mechanical. The reason I'm suggesting the black hair and eyes, and the fuller lips, is to give me the latitude to play with sultriness, sensuality, and mystery, all at the same time. . . ."

Melissa looked on impassively. It was a charade, of course. The faces sketched out on the screen were essentially insipid, in spite of all the skill the computer had in the matter of rendering them lifelike. The program could keep track of the changes in six hundred independent variables, able to alter each one by the subtlest fractions, and the software engineers claimed that the program and the computer's display screen could

represent every human face that had ever been worn and ever could be created. But at the end of all that, a face was a living thing, and the true artistry involved in creating faces more beautiful than any that had previously been seen or made only showed up in the living flesh. Orchisson could tell Helena Wyngard what *kind* of face he intended to make for her, but he could not show it to her as it would really appear; she would have to trust him to add the touch of magic that would turn a dead design into a fabulous fantasy.

When Helena finally said, "It's marvelous," her voice was like the purr of a cat—supremely generous and contented, but with a hint of the predatory about it.

"I'm *so* glad," said Orchisson, loading his own words with carefully modulated sincerity. "I know that I'm taking on a lot, to work with a face that has been sculpted by Steinhardt and De Cosimo—not to mention Vulovic and Bacik—but I really do think I'm ready, and more than ready. The gift that an artist has can only be caught once at the fullest point of its flowering. This is *my* time; I feel it in my bones."

This concatenation of clichés was too much even for Helena, who turned gracefully away from Orchisson to look Melissa full in the face.

"I do appreciate the importance of your part in all this, my dear," she said. "I've undergone reconstruction enough times to know that an artist is nothing without appropriate technical support. You have a genius too, Dr. Sai, and I know what a debt I will owe to you, as well as to Roy, if this works out as we hope it will."

"It will work out," Melissa promised, coldly. "But my part is routine. Roy is the sculptor—I just make sure the clay is malleable, without any damage to the model."

Helena Wyngard smiled, and in that smile Melissa saw how casually she had been dismissed. The woman's real purpose in looking at her had not been to pay her a compliment or reassure her that her supporting role in the planned operation was a worthy one, but simply to make sure that there was no possibility of Roy's affections being deflected from their intended target. She had judged at a glance that there was not.

"I'll show Helena around the theatre," said Orchisson to Melissa. "Then I'll take her back to her hotel. Could you possibly look after Mr. Schafran?"

Melissa raised an eyebrow, but nodded dutifully. She bowed to them both as they moved toward the door, leaving her behind with the personal assistant. She looked at the face displayed on the screen, which would soon be the face about which every 3-V frontperson would be asking the vital questions.

Has the Most Beautiful Woman in the World done it again?

Has the New Boy from the Midwest topped the great Saul Steinhardt?

Has Helena found the Love of Her Life at last?

"How could anyone ever have believed that love was blind?" said Wilson Schafran silkily. "Or that beauty was only skin deep? You must let me take you to dinner, Dr. Sai, so that we can settle the financial details. I happen to know the most *wonderful* little bistro. . . ."

* * *

Melissa saw very little of Roy during the following week. He was too busy letting his hormones run wild, honing his Magnificent Obsession to just the right pitch of intensity. He was also busy being seen out and about with his inamorata, making sure that all the world's vidveg knew exactly what was going on. All the preparations for the long series of operations were left to Melissa.

She tried to console herself with the thought that he would get over it, in time. In a hundred years, when he was newly third-time-young and she had taken her turn to test the prevailing wisdom that said that third rejuvenations never took, they would surely be able to laugh about it. There were thousands of Helena Wyngard's ex-lovers in the world, and well over half of them showed no emotional scars at all after the first thirty years or so. Roy would still be a first-rate facemaker when Helena had finished with him.

Melissa should have been reassured by such observations, all of which were true, but she was not. She had wanted something else for Roy: for him to rise above the morass of media mythology, to be his own man. She had hoped she would never have to take refuge in reminding herself that although love might be the last of the unconquered diseases of man, it was very rarely fatal.

She had always wanted to find a partner who would mirror her own coolness, her own control, and she had thought for a while that Roy might be the one. The historical moment had seemed ripe for men to stop conducting themselves like poodles in heat, and start growing into the clothes of reason—but she had been too optimistic. The sad fact was that Roy had taken it into his head that he had fallen in love, and he fell hard. By the time they began the Great Work, he was in a veritable fever of excitement.

In the past, he had always been a quick worker. Melissa had always admired the deft gracefulness of his hands. This time, though, he was posing as a perfectionist. It was not enough that the right result be achieved; it had to be achieved effortfully. She had never seen him poke and probe so much to so little effect, nor be so doubtful about the results of his sculpting. But she bore with him, never uttering a word of criticism; she was, after all, a true professional.

Slowly, Helena Wyngard's latest face took shape. Twenty-four hours into the series it looked like a complete wreck; forty-eight hours passed before it even began to look salvageable. By the time the third day was coming to an end, though, Melissa had begun to see in her mind's eye what Roy must be seeing in his. She began to appreciate the cunning and the daring of his approach, and began to see the genius shining through.

Melissa had little sympathy with those cynics who said that there was only so much that could be done with the human face and that all the possible permutations had already been exhausted; for all her dislike of 3-V-ese phraseology she really did believe in Pushing Back the Horizons of Beauty, and she knew that Roy Orchisson was doing exactly that while he worked on Helena Wyngard. However unworthy his motives and

methods might be, Helena really was his Galatea; this was his finest work to date, and it was difficult for Melissa to imagine that he could ever surpass it.

On the fourth day, he began to introduce innovations at the technical level, which was something she had never known him to do before. She was deeply hurt that he hadn't checked it out with her, given that the technical side of the operation was her business.

"I don't like it, Roy," she told him, as soon as they took a break. "You're not supposed to introduce novel DNA without a full discussion of its probable effects. You're *certainly* not supposed to use novel DNA without even telling me what it is or what it's supposed to do. I carry the load if anything goes wrong at the technical level—it's my responsibility. Whatever you're using, it's not even registered."

"Nothing will go wrong," he assured her. "It's no big deal, biochemically. It's just one more special effect—but it's my secret, okay? A great artist is entitled to his idiosyncrasies."

"It's *not* okay, Roy. We're working *together*. You've never used any novel DNA before without checking it through with me. I don't like it at all."

"I'm a big boy now, Missy," he told her. "You don't have to mother me any more. I don't have your practical skill in de-differentiation, but I know my genetics. An artist is entitled to mix his own colors if he can't get the tints he needs off the shelf. Trust me, Missy—this is the big one, and I really need to do it *my* way."

She knew, at that point, that she had lost him for good. From now on, he would go his own way. He had stopped thinking of her as the person who had detected and nurtured his talent, and had begun to regard her simply as a tech—an assistant, whose role was to do as she was told.

She was hurt by this, but she went back to the operating table and got on with the job. She continued to support him throughout the operation, to the very limit of her skill. That, she thought, was the professional thing to do.

Whatever the novel DNA was that Roy had used to transform the tissues of Helena Wyngard's face, it certainly did no harm. She came out of the operation more beautiful than she had ever looked before—perhaps more beautiful than *anyone* had ever looked before. Roy was certain of it; Melissa was certain of it, and even Wilson Schafran was certain of it.

"If ever I was going to go straight," said Schafran, at the first public show, "I'd go straight for *that*." It made headlines on the 3-V, in spite of the fact that he had said it at least three times before in the course of the last seventy years. Vidveg had notoriously short memories.

The pantomime romance continued on its inevitable course, mapped out in painstaking detail by the insatiable 3-V cameras. Helena and Roy were deeply in love; Helena and Roy were traveling around the world; Helena and Roy were greeted everywhere with wild acclamation.

Meanwhile, Melissa knew, Helena would be sharpening her claws. The demands that she made on her partner's time, attention, and bank balance would gradually grow to take over his every waking moment, and would still be unsatisfied. Other would-be lovers would be queuing up to drink in the delicious smiles of her new face and offer up their unqualified adoration. At first she would be content with flirting and tantalizing, but not for long. Soon she would begin complaining about Roy's possessiveness, and would make the point that his creation was, after all, *her* face, to do with as she wished. Eventually, she would explain to everyone how unreasonable he had become, and how he had fallen victim to the same disease that had claimed so many of her earlier facemakers: the disease of thinking that he owned her.

But it never quite got that far.

It transpired that Roy *was* different, in a way that neither Helena nor Melissa had anticipated.

It was Wilson Schafran who was delegated to bear the bad news. He called to say that he had traveled all the way from Queensland to California for the privilege of having a very quiet word with Melissa, in person and in the strictest confidence. He wouldn't meet her in a hotel or in one of his wonderful little bistros; he wanted to be well away from the nearest microphone or camera—which wasn't easy to arrange in a world whose walls were so liberally equipped with eyes and ears.

She finally agreed to meet him on a lonely stretch of private beach. They left their separate robocabs to wait with meters running while he took her for a walk along the moist sand below the high-tide line.

"We have a problem," he said. "And by *we* I don't just mean Helena and Roy. Your neck is on the line too, if what your favorite facemaker says is true."

"What does he say?" she asked frostily. But Schafran wasn't that direct.

"Helena did him a big favor, you know," he said. "Coming to him to have her face done. It's the best publicity a guy in his line of work can ever have—it'll set him up for life, and that can be a long time nowadays. And she took a risk doing it, you know. She's third-time-young, and you know how rare it is for anyone to get a fourth turn. Barring miracles, she's only got two more faces left—three at the outside. I don't mind telling you that it wasn't just Orchisson's talent that brought her to the two of you. She knew about *you*, too. She knew there wasn't a safer pair of hi-tech hands in the world, and she wanted to be absolutely sure that nothing could possibly slip up on the technical side. She trusted you."

"Are you trying to suggest that something *did* slip up on the technical side?" asked Melissa.

"Could be," he said glumly. "We're not entirely sure. It might be that Orchisson's telling lies—he wouldn't be the first guy to try something crazy when brush-off time rolled around. You'd think that after all this time they'd know the score, wouldn't you? They must, in their heart of hearts—but every damn one of them gets it into his head that he'll be the one to tame her . . . the one who'll give her the face that she can't bear to trade in. That's what gets them, you know: it's not so much that she starts using her faces to reel in other guys, but the thought that once they're history she'll start looking around for a

new facemaker. It really hurts them deep down, to think that their great work of art won't even last until her next rejuve. Like I say, they all tend to go a bit crazy. More than one guy has threatened to vitriolize her—talk about cutting off your nose to spite your face. But your boy has come up with a new twist on that one."

"What new twist?" she asked sharply. She was unhappy at the turn that the conversation had taken, and her stomach was already knotted up with alarm at the thought of what Schafran was implying.

"Orchisson says that he and his work of art are a package," Schafran told her. "He claims that when he rebuilt her face, he built in a booby-trap of some kind. He says that if and when he gets tired of her, and decides to let her go, that will be okay—but he's not prepared to be cast aside like a worn-out sock until he's good and ready. He says that if he's forced out before he's ready, he won't leave the face behind—he says that he can trigger its decay overnight, and that it will leave such a mess behind that it will be impossible for any other facemaker to rebuild her. Personally, I think it's all bullshit, because a trap like that would have to be laid by you rather than by him, and I know that *you're* not crazy—but he says that he sneaked some unregistered DNA into the op without your okay, and I have to check it out. Tell me, Miss Sai, is it true?"

Melissa stopped and turned to watch the waves playing with the shore. The wind that spurred them on was surprisingly cool, but she felt uncomfortably warm.

"I don't know," she said, after a few moments.

"What does that mean?" said Schafran icily.

"I mean that I didn't do anything of the sort, and I can't really believe that he would. But he *did* use some novel DNA—unregistered stuff. We both know it's illegal, but we both know that it happens all the time. He didn't check it with me, or clear it with me—I gave him hell at the time, but I took it for granted that it was something trivial, something harmless. I could be wrong. But he's wrong too, even if he did lay some kind of booby-trap. Nothing could stop a new facemaker from doing a rescue job—nothing short of outright murder."

Schafran smiled wryly. "I told her that. But Orchisson has a cunning streak. Helena won't take chances with her face—not even million-to-one chances—and he has her running scared. You have to talk to Orchisson, Miss Sai. You have to get him to back off. I don't have to tell you what it would do to him—and to you—if he really does mess up her face, even temporarily. It would be the end of everything for both of you."

"Yes," she agreed dully. "It would, wouldn't it."

That was the natural end of the conversation. But as they walked back to the highway, he surprised her by saying, "You love him, don't you?"

"Not the way you mean," she retorted.

"I know I play the fool," he said soberly, "but that's only a job. Believe me, Miss Sai, I mean what you mean. You love him the way I love *her*: cleanly, aesthetically, platonically."

"I thought you only liked men," she said—but it was surprise, not bitchiness, that made her say it.

"I only have sex with men," he said. "But this is the twenty-fourth century, Miss Sai. We're born from artificial wombs and sterilized at birth. The idea that love and our redundant animal instincts are flip sides of the same coin should have been laid to rest three hundred years ago. You understand that, and so do I—but the vidveg don't, and Helena and Orchisson don't. It's a shame, but you and I are the only sane players in the game and it's down to us to save it. Talk to him, Miss Sai. Explain to him that we're different now—that we can be *human* beings, if only we're prepared to make the effort."

It was a good exit line. She had to give him that. She couldn't really respect a man who could make a career out of playing court jester to Helena Wyngard and call it love, but his way of putting things had a certain piquant charm.

Needless to say, Melissa had to fly all the way to Oz to talk to her wayward protégé; he wouldn't respond to any kind of a summons. Once she was there, he still tried as hard as he could to avoid seeing her in any place where they couldn't be overheard. She finally managed to corner him on a traffic-island in the center of Brisbane, and he conceded defeat when it became obvious that he could only get to the button that would stop the traffic by shoving her violently aside. He consented to let her engage him in conversation while the robocabs whizzed around them in a hectic but perfectly programmed collison-free whirl.

"You have to stop it," she told him. "You have to tell Helena that this booby-trap nonsense is all lies."

"Why should I?" he said, refusing to meet her eye. "And what business is it of yours anyhow?"

"First," she said, trying not to sound too much like a co-parent scolding the household brat, "because it *is* all lies. Second, because trying to resurrect a dead relationship is a fool's game even if you forgo blackmail and stick to relatively dignified methods like crying your eyes out and begging. And it's my business because anything you say in public about this makes me an accessory or a dupe, either of which is enough to crucify my career along with your own."

"You don't know for sure it's a lie," he told her.

"Yes I do," she said. "You don't think I would let you use novel DNA without checking it out afterward, do you?"

He looked up at that, surprised but still furtive. "You told Schafran you couldn't be sure," he pointed out.

"I lied," she said. "Maybe I shouldn't have, but I did. I wanted a chance to talk some sense into you."

He looked at her speculatively. She could see that he was trying to judge from her expression whether or not she was lying now; she knew that he wouldn't be able to. Whatever people claimed, it really was impossible to tell the second-time-young from the first-time-young by looking at them, but when it came to reading their features for guilt and guile, rejuvenates had all the advantages of their actual years.

"Okay," he said finally, "so I spun her a line. But it wasn't what you think. I'm not the lovesick moron that everyone seems to think I am. It's just that . . . well, I

wanted to *stop* her. Maybe not even that . . . maybe I only wanted to slow her down, make her think about what she is and how she lives. I really did love her, for a while . . . and that face I gave her really is a masterpiece—even you have to admit that. In fact, it's *because* her face is a masterpiece that I didn't want it treated like one more product on the conveyor belt. I mean, Missy, that woman is *sick*. I just couldn't let her do it—I couldn't let her destroy a work of art like that. It's *my* face, Missy . . . it's *our* face. Surely you can understand why I didn't want to just kiss it goodbye and let her drag it through the dirt."

"You didn't have any objection to her destroying Saul Steinhardt's masterpiece," Melissa said quietly.

"That was different," he complained.

"Not to Saul," she said. "Saul was very proud of that face. Very proud indeed."

"Mine's better."

"His was the best he could do," she pointed out. "And though it may seem like heresy to say so, these things really are a matter of taste. Beauty is in the eye of the beholder."

"Crap," he retorted. "Chemistry and electricity are in the eye of the beholder—chemistry and electricity which respond to cues that were written into the genes millions of years ago. Even *you* can't rebuild brains so that they think beautiful faces are ugly and vice versa. Beauty is real, Missy, and that's why there's such a thing as art. Keats was right about truth being beauty and beauty being truth. And that's why Helena Wyngard needs to be tamed. She's not an art-lover, she's an art-destroyer, and her career stops here, with *my* face. Okay?"

"You know perfectly well it's not okay," she told him, sorely annoyed at having to listen to so much bullshit. "You just wanted to give her the boot, instead of letting her do it to you. You just wanted to scare her a bit, to punish her for not having the grace to treat you just a little better than she treated all the rest. Well, you've done it, and now it's time to stop. Tell her that it was all nonsense, and come home with me. There are faces to be made, Piggy—lots and lots of lovely faces."

"No," he said. "I won't do it. I want her to stay scared —and she *is* scared, you know. She's coming up to the end of the line, and she knows it. Even if her fourth rejuve adds a few more years to her life, she'll never be truly young again. Even if she doesn't die, she'll have to grow old. She doesn't like that idea one little bit, Missy. She's really scared. Even Schafran doesn't know how scared she is, but I do. That's how close we became, Missy—that's how close we were, until she got bored."

"If you don't tell her," Melissa said, "I will."

"She won't believe you," Orchisson countered, trying as hard as he could to seem smugly certain. "Unless it comes from me, she won't believe it."

Melissa pursed her lips, and watched the traffic whizzing around the island come smoothly to a halt when the lights changed, allowing a party of pedestrians to cross over. Roy could have escaped then, but there was no longer any point. As they passed Roy and Melissa, the pedestrians stared at them in the frankly disbelieving fashion that Australians always had when they encountered anything out of the ordinary. Melissa waited until they were gone and the traffic was moving once more before she spoke again.

"I don't want to hear this kind of thing from you, Roy," she said, radiating disappointment. "It's not worthy of you. You're a better man than that. You accepted a role in Helena Wyngard's real-life soap opera, and you played it to the best of your ability, but now it's time to get on to something else. She's been stuck in the same fantasy for three lifetimes, but you don't have to be. Give it up, Piggy, *please*."

She came forward to take his arm, intending to link it with hers—but the more intimate territories of his personal space were still pledged to Helena Wyngard, off-limits to her. He stepped back reflexively in order to avoid her. He recoiled so urgently that he stumbled.

He caught his heel on the raised curb of the island, and he fell backwards into the road.

Robocabs had far better reflexes than anything ever driven by human beings, but even they couldn't repeal the laws of motion. The one that was zooming along the lane into which Roy Orchisson fell had too much momentum to stop in time, and its near-side wheel went right over his face—the face, that is, which he wore on the front of his own head. The weight of the vehicle pulverized his skull and the brain within.

Melissa screamed, and went on screaming for quite some time, while all the lights in the area changed to red, and the whole world came belatedly to a halt.

The funeral was a very grand affair. Violent deaths were rare in the modern world, and tended to be represented as awful tragedies by the professional hysterics of the 3-V even when they involved people of no particular significance or celebrity. When a man with Roy Orchisson's high media profile was killed by falling off a traffic island, it was a suitable occasion for an orgy of public mourning such as was seen only twice or three times in a decade.

Thirty thousand people turned up at the cemetery, and the eulogies—which took up three hours of the primest time—set a new ratings record in the extended documentary category. The world wept for a great genius laid to rest at the absurdly early age of thirty-nine, bemoaning the loss of all the fabulously beautiful faces that he might have made in the course of the next two and a half centuries.

Not unnaturally, the focal point of all the media attention was Helena Wyngard—who, it was widely alleged, had at last found the One Great Love of Her Life, only to have him cruelly snatched away at the very height of their passion. There was now no shred of doubt that her face was the greatest work of art Roy Orchisson would ever produce, and the fact that it was marked so obviously with a very special grief added tremendously to the natural attraction that it exerted over the cameras. All of Helena's faces had been newsworthy for a while, but circumstances had made for this one a whole new order of magnitude of newsworthiness.

The moment would have passed, of course, in the normal course of affairs. Nine days was still a respectable lifetime for a media-hype wonder, and very few *causes célèbres* could survive one rejuvenation, let alone two. But at the end of nine days, the tears that stained Roy Orchisson's masterpiece had begun to have an uncanny effect.

Helena Wyngard's face was changing. Its astonishing beauty was beginning to fade.

Melissa Sai discovered this at exactly the same time that everyone else did, and in spite of what she and Wilson Schafran had discussed, she assumed at first—as everyone else did—that it was only an effect of crying so many tears, of an understandable overindulgence in extravagant lamentations. Melissa knew, after all, that there was no booby-trap—that Roy Orchisson's threat had been quite empty. She had, of course, taken the trouble to inform Helena Wyngard of that fact, in no uncertain terms, and Helena had believed her, or had seemed to.

But as the days wore on, and the cameras that might have resumed their ceaseless search for other images lingered just a little longer, it became gradually obvious that the fading of Helena's beauty was no mere illusion or temporary effect of emotional strain. Her face—the most famous face in the entire world—was falling by degrees into ruin. Nor was the change any mere acceleration of normal aging; it was worse than that.

Incredibly, Helena was slower to realize what was happening than the vidveg, who saw her from a great distance, but always in intimate close-up. Wilson Schafran told Melissa, when he called to plead with her for urgent assistance, that it was not Helena's mirror which first convinced her that something was dreadfully wrong, but seeing herself on 3-V.

While Melissa crossed the world for the third time in as many weeks, Helena Wyngard was already trying to go into hiding; but there was no beach or traffic island in the world remote enough to evade the cameras, if the cameras did not want to be evaded. Helena continued to be headline news, and the world watched her beautiful face become gradually derelict.

Oddly enough, no rumor of Roy Orchisson's malicious threats ever escaped—or, if it did, it was quietly disregarded by media frontpersons who were busy building a different story around the compounded tragedy.

Helena, in their representations, was pining away. Having lost the One Great Love of Her Life, she had lost her Will To Be Beautiful.

It was a marvelous story, because it was at once so utterly unprecedented and so utterly familiar. It had been said of countless people that they had lost their hypothetical will to live, but that was back in the Dark Ages, before the sophistication of modern medicine. In today's world, it seemed so much more appropriate that one should lose instead the Will To Be Beautiful, and if there was tragedy to be found in the contemplation of anyone suffering such a fate, Helena Wyngard was the ideal candidate. She had the heartfelt sympathy and unbridled pity of the entire world.

* * *

Melissa Sai and Wilson Schafran eventually found a place where they could talk privately, though they had to leave Helena behind in order to arrange it safely. It was in the protected wilderness of an unreclaimed sector of the Nullarbor Plain. There they discussed the possibilities before them.

"Technically," said Melissa, "there simply isn't a problem. The deterioration is purely psychosomatic. But that's why it's difficult to issue a confident prognosis. I can rebuild her face in a matter of days, with or without an artist—but if the shock, or the fear, or whatever caused this is still there . . . it might just start again. There are things beyond any geneswitcher's control, and I can't promise anything. I'm sorry. I'm sorry for everything."

"That's okay," said Schafran. "It's not your fault. It's not even Orchisson's fault. She knew that his juvenile bullshit was all hot air. She always *knew* it . . . but she just couldn't quite make her face believe it. Deep down, the fear is much more powerful than anything she knows. Her mind believed what you told her, but her body is saturated by anxieties that won't be quieted by mere thought. She's very old, you know . . . much older than she used to look."

"Aren't we all," said Melissa.

"So we are," he agreed in a low tone. "But we haven't yet learned to cope with it, have we? Most of us have emotions that are still rooted in the distant past. We can change our faces, but the rest of it still defeats us. We want you to operate as soon as you're ready, Dr. Sai. She doesn't want to use an artist. She just wants a face: a face like yours or mine. This time, she doesn't think she needs a work of art. She's decided to leave the task of Pushing Back the Horizons of Beauty to others, at least for a while."

Melissa nodded. She expected Schafran to say something more, but he didn't. He just stared at the horizon, and all the wilderness displayed before it.

"He was a genius, you know," said Melissa. "And I did love him, in spite of everything. Cleanly, aesthetically, and platonically—the kind of love that ought to be *true* love, now that we're what we are, instead of what we were. You were right about that."

"I always am," said Schafran. "It's the one and only privilege of agreeing to play the fool without actually being one."

"It's not so bad for you," said Melissa. "After all, my Pygmalion's dead and buried. At least your Galatea is still alive."

"But she's not beautiful any more," he said, in a voice as flat and bleak as the plain. "She's not a work of art. She's only a woman. What good is that to me?"

"Beauty," she said, forgiving herself for once the lapse into cliché, "is only skin deep."

"Aesthetically," he said, "skin deep is all there is. That's why we could be living in Utopia—if only we could adapt."

"If only," she agreed.

Then they turned away from the unappealing wilderness, and headed back toward civilization. ✦

The Drifter

Lawrence Watt-Evans

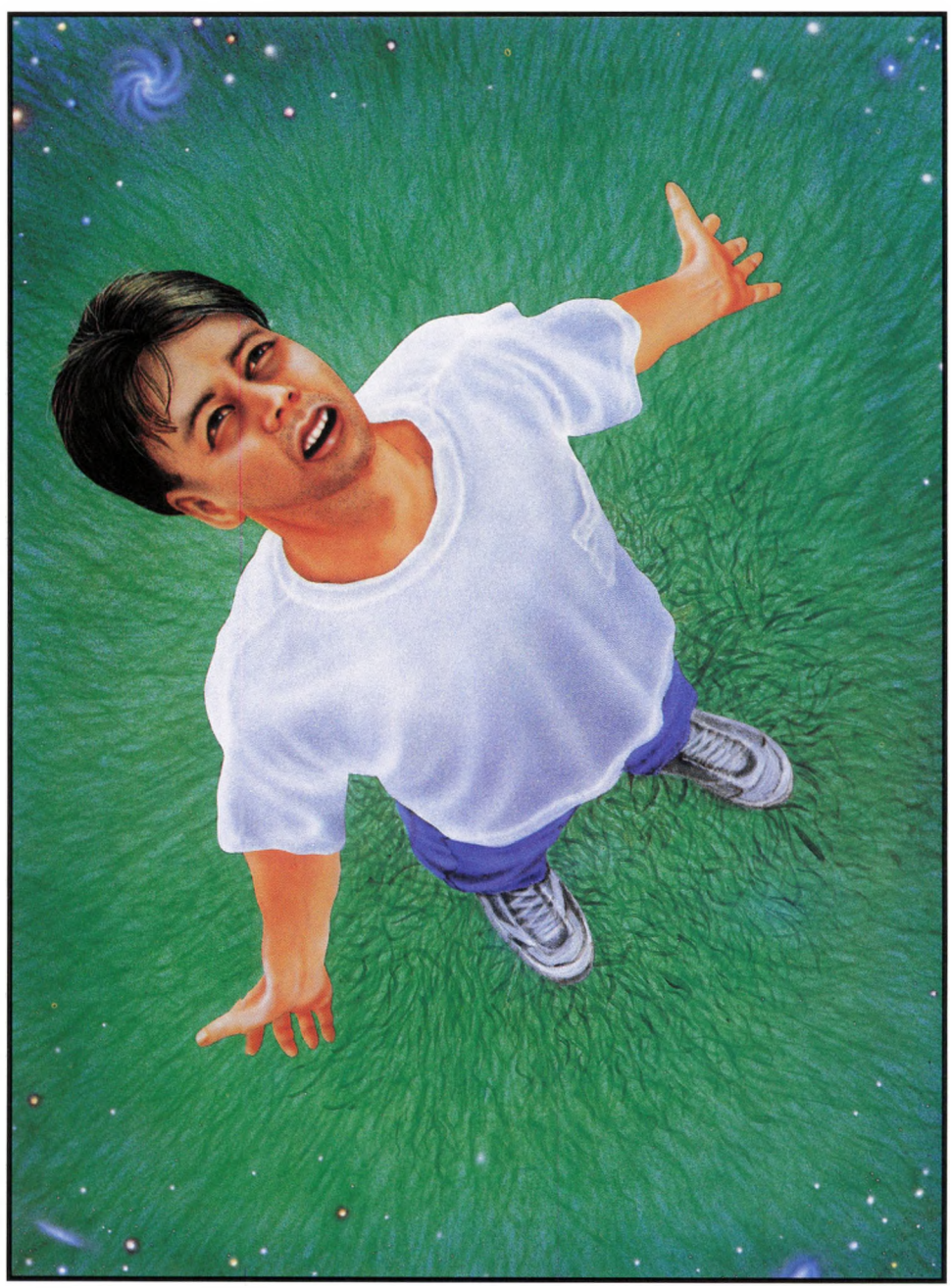


Illustration by Mark Maxwell

He didn't really listen as the explanation droned on; he had already made his decision. As soon as the scientist finally shut up, he said, "Sure, I'll do it."

The scientist blinked uncertainly at him. "You're sure? I mean, you understand that this will change your life *permanently*, if it works?"

"Yeah, I understand. That's no problem; my life could use some changes."

"We don't know how much, you understand—we can't calibrate it yet."

"I know; that's fine."

The scientist obviously thought the volunteer was crazy, but the volunteer didn't care. It was *his* life, after all, and he knew just how boring and crummy it had been so far; the scientist didn't. Letting them push him into some other world sounded like as good an idea as any.

There was a chance he'd get killed, of course; they had told him that, insisted he sign papers attesting that they'd told him that. It didn't bother him. There was a chance he'd get killed every time he crossed the street, or drove down the block, or flew home to visit his mother in L.A. That was no big deal, and the odds

here didn't really look much worse than everyday life. This traveling into other universes was certainly safer than walking through some parts of town after dark.

And there was a chance it would make him rich and famous, and that was a kick, no doubt about it, and that chance looked just as likely as the chance of getting killed, so he was willing to try it.

He didn't care about the technical stuff; they were writing all that out for him, so he didn't need to know any of it. He got the gist of it, the basic theory, and that was plenty enough to interest him. It wasn't anything all that unheard of—he'd seen the idea in stories, even in Hollywood movies. It was a staple in science fiction.

When he'd answered the ad for volunteers, though, was the first time he'd ever heard of anyone taking it seriously as science, rather than fiction.

They were looking for alternate realities. The theory was that rather than one universe, reality included an infinite number of universes, all rolling along side by side without touching—parallel worlds, the science fiction writers called it, or diverging time-streams, depending upon how they modeled it. The parallel theory said that all the universes were there all along; the diverging theory said that originally there was only one, but that each time an event could have gone two different ways, it *did* go two different ways, splitting the existing universe into two, one for each possibility.

The volunteer didn't see that there was really much of a difference between these theories, but the scientists considered it an important distinction, and he didn't argue.

Whichever it was, they intended to send him into another universe.

He thought that was a pretty nifty idea—him, Danny Royce, the first man to visit another universe!

Of course, the catch was that they didn't think he could come back.

The gadget they'd built—it filled most of the basement of the physics building, where the cyclotron used to be, but Danny still considered it a gadget—was going to push him into another world, but all it could do was push, not pull; in order to get back he would need to land in a reality where there were people who had developed a machine of their own that could push him back.

And they didn't know how to aim, either, so even if his new universe *did* have a machine, he might not wind up back where he started.

Now, right there, Danny told himself with a smile, is where ninety-nine percent of the volunteers would back out: live the rest of his life in *another world*? Fat chance.

But Danny had listened further; after all, what did he have to lose, besides his sick old bitch of a mother and a bunch of college loans he wouldn't be able to pay off, because with the grades he was going to get this semester he wasn't going to graduate?

And they'd gone on to say that they weren't going to push him very *far*, not on the first human trial; they were going to use the minimum power needed to overcome his temporal inertia—whatever the hell that was.

"The chances are good," the scientist had said, "that you won't see any obvious changes at all when you emerge. You may need to research extensively to find any differences. It may take weeks to be sure whether you've moved or not, because you should land in a universe similar enough that they'll have just sent out their reality's version of you."

And hey, that made it easy! Rich and famous, just for going through this machine and coming out someplace that he couldn't even tell the difference?

If it worked, and nothing went wrong.

If it didn't, if they'd guessed wrong, he could get killed, he could wind up in Nazi America, or World War III, or Orwell's 1984 ten years after.

But hey, really, what did he have to lose?

"Sure, I'll do it," he said.

So he signed more forms, and a doctor gave him a physical, and a psychiatrist talked to him for an incredibly boring hour, and at last they took him down into the basement of Palmer Hall and put him into the sphere at the center of the gadget, and threw switches.

The sphere closed around him, and he was alone in the dark, unable to hear anything but a faint hum, and something pressed on him from every direction at once, until he thought he could hear his bones creaking, and his heart was beating fast and so loud he could hear it over the hum, and he wondered if he would throw up, and then the pressure stopped, and the hum died away, and the sphere split open around him, light spilling in a perfect circle that widened into a cylindrical view of the world around him. He stepped unsteadily out into his new world.

It looked exactly like the old one.

He blinked at the scientist—Dr. Hammond, it was, Hammond at the keyboard, like those Hammond organs, except that the keyboard was a computer. "Did it work?" he asked.

Hammond glanced at his associates, then back at the volunteer. "I don't know," he said. "Does anything look any different?"

Royce looked around carefully. Gray metal boxes, silver conduits held together with baling wire and duct tape, servomotors in black, silver, and copper—the gadget looked the same, but he wouldn't notice any difference unless it was really major, because he had never looked that closely at the thing in the first place.

Bare brick walls with sloppy mortarwork, light bulbs in rusted steel cages, concrete floor with cracks running across it—the basement looked the same.

Three physicists in white lab coats: Hammond, Brzeski, and the one with the Middle Eastern name Royce hadn't caught, all of them with dark hair; Hammond and the Arab, or whatever he was, with mustaches; Brzeski needed a shave and a haircut, his glasses were crooked —the scientists looked the same. The computers, the videocameras, all of that was just what he remembered from five minutes before.

He shrugged. "Looks the same to me," he said.

The physicists looked at each other, frowning.

"Did you bring anything with you?" Brzeski asked.

"Oh, yeah," Royce said. He held out the thick loose-

leaf binder that contained the technical notes. "You gave me this."

Brzeski accepted the binder and thumbed through it, while Royce stood waiting.

"It looks the same," Brzeski said. "Let's check the numbers."

Hammond nodded, and pulled another binder out of a desk. The three bent over the papers.

"Hey," Royce said, "What about me? What do I do now?"

Hammond looked up, and pursed his lips. "Well, we'll want you to see Dr. Chin again," he said.

"We'd better do that right away," Brzeski agreed, closing the binder.

Hammond considered. "Here, you two go ahead and check the notes," he said. "I'll take Royce up and get this taken care of."

The others nodded agreement, and a moment later Hammond and Royce were climbing the stairs, on their way to get Royce another physical.

"So," Royce asked at the first landing, "did I go anywhere or not?"

Hammond didn't answer immediately; in fact, they were halfway across the drive, on their way to the campus infirmary, before he said, "We don't know yet."

"So when *will* you know?"

Hammond hesitated, but as they stepped up on the sidewalk he said, "We may *never* know. If we find a difference, then we'll know, but if we don't find a difference, it won't prove anything; it could just mean that you landed in a universe where the only difference is, say, that some unstable radioisotope on some distant planet had atom A go poof, instead of atom B."

"Hell," Royce said, "if that's the only difference, for all you know, people could go bopping about between universes all the time, without any million-dollar gadgets, and you wouldn't know a thing about it."

"That's true," Hammond agreed, as they climbed the infirmary steps, "And that might in fact be the case, that people *do* drop from one universe to another spontaneously. That might explain a great deal."

"You must have done animal experiments," he said. "Did you get any changes with them?"

Hammond hesitated again; they were in the infirmary lobby. He paused, instructed the nurse receptionist to tell Dr. Chin they were coming up, then led the way to the fire stairs.

"Yes," he said, "we did animal experiments. Hundreds of them. And the results were confusing."

"How, confusing?" Royce asked, uncomfortably.

He should have asked this *before* the experiment, he realized. He stumbled as his toe hit a step that was higher than he expected, but caught himself on the railing and continued.

"Well," Hammond said, "we sent guinea pigs, mice, and rats, for the live-animal trials, and books and papers for inanimate-object trials. Some of them didn't change at all, any more than you did—especially at minimum force. At maximum force they all just disappeared, and we never saw a trace of them again; we must have sent those so far away that any parallels sent toward us at the same power shot right through without stopping. In between, though—well, that was confusing."

"How?" Royce demanded, holding the handle of the fire door at the top of the stairs.

Hammond sighed. "Well," he said, "Some of the animals vanished, some didn't change—and some *did* change. We sent out rats and got back hamsters, sent white guineas and got back brown, sent textbooks and got back novels. Sometimes we didn't send *anything*, and we got stuff appearing in the sphere, rats and books and once a slide rule with the numbers in Arabic."

"Arabic numerals?"

"*Real* Arabic, not the numbers we use."

Royce nodded. He opened the door and stepped through into the hallway beyond, Hammond close behind. "That doesn't sound so confusing," he said. "I mean, weren't those what you expected?"

"Well, yes," Hammond said. "Pretty much. The really confusing part came after we took things out of the sphere."

"Why?"

"Because some of them vanished later. Lab animals get loose, sometimes, and things get mislaid, but things like that have happened much more than usual on this project. It's got Dr. Brzeski a little spooked, I think. And sometimes animals have turned up in the wrong cages, or we've found animals we don't recognize in the cages —it's confusing, as I said."

Royce felt an uneasy chill. "You mean that this might not be entirely over for me?" he said. "There might be some sort of aftereffects?"

"There might be," Hammond admitted. "We just don't know."

Then they were in Chin's examining room, and Royce was obediently taking his shirt off.

The exam found nothing out of the ordinary. After the physical was done, Hammond and Chin asked Royce to stay for observation; he reluctantly agreed.

They were paying him, after all—ten dollars an hour, they'd promised.

A nurse brought him a magazine, and he sat and read. The magazine seemed oddly slippery, which he attributed to nerves; he couldn't see any shaking, but his hands did seem somehow unsteady.

It was tiring, trying to read the tiny print when it didn't want to hold still, so after a while he put it down, lay back on the couch, and took a nap.

When he awoke it took a moment to remember where he was. He sat up and looked at the clock—he had slept through the night. He must have been much more tired than he had realized.

And he hadn't had any dinner; he was ravenous. He glanced around.

There was a magazine on the table, and at first he thought it was the one he had been reading, but that had been *Newsweek* and this one was *Time*. He wondered why anyone would have switched it.

The door was closed; he stood up and opened it.

The hallway was empty and silent.

He hesitated, but then shrugged. What the hell, he thought, he wasn't a prisoner or anything, he was a volunteer. There wasn't any reason to bother anybody here, or settle for infirmary food. He had his wallet in his pocket, after all.

He walked up the hill to the edge of campus and got himself a breakfast at P.J.'s Pancake House, then drifted back.

Just where to go was a good question; he could go back to his room, or to the infirmary, or to the gadget room in the basement of Palmer. If he went back to his room, Hammond and the rest would probably be pretty pissed, and there wasn't anything he wanted to do there in any case. If anything was happening, he'd miss it.

They probably expected to find him at the infirmary, but it was *boring*, sitting around there reading last week's news.

He headed for the physics lab.

Brzeski was asleep in a chair in the corner, his head down on the desk, the computer screen in front of him displaying an array of complex mathematics. Hammond and the other guy were poring over a stack of papers.

"Hey," Royce called, "what's happening?"

The two looked up, startled.

Royce looked back, startled.

"Hey," he said, "what happened to the mustache?"

The Middle Eastern guy's right hand flew to his face, feeling the bristly hairs; Hammond turned to look at him.

"No," Royce said. "*Your* mustache, Dr. Hammond."

Hammond stared at Royce, his hand creeping up to feel his own upper lip.

There was no mustache there, only a faint dark fuzz that had resulted from not yet shaving that morning. "What mustache, Mr. Royce?" Hammond asked.

"*Your* mustache," Royce insisted. "You had one yesterday, a thin one sort of like Clark Gable. Made you look like . . . well, you had a mustache."

Hammond and his associate looked at each other, then back at Royce.

"I have worked with Dr. Hammond for three years now," the other one said, "and I have never seen him wear a mustache."

"Are you quite sure I had one, Mr. Royce?" Hammond asked.

"Quite sure, yeah," Royce agreed.

"That was before the trial?"

"Before the experiment and after, yeah; you had it last night when you left me at the infirmary."

The two looked at each other again; then, abruptly, there were three of them, as Dr. Brzeski was simply there, standing beside them. Royce stared.

"I think," Dr. Brzeski said, "we have a problem."

The tools that gave them the final clue weren't any complicated pieces of laboratory apparatus, but the office photocopiers.

Included in the notebook Royce had carried was a page of random numbers, on the theory that this would provide an ideal way to check for small random changes. It was a photocopy of one that Dr. Hammond had kept on his desk, and the theory was that the two sheets of paper could be held up to a bright light, superimposed over one another, and any differences would show up immediately.

This had in fact been done immediately after the experiment, and no differences had been detected.

When Royce had appeared, inquiring after Hammond's mustache, the two were compared again, and no fewer than eleven digits had changed.

The two sheets were then taken upstairs to the office of the departmental secretary, where two photocopiers resided. The original was put in one machine, the copy that Royce had carried in the other, and both machines set to turning out copies one after the other.

Every copy of the original was identical, from the first until the machine ran out of toner some seven hundred pages later.

The first copy of the copy was just as Hammond had recorded it moments before, with eleven differences from the original. So was the second, and the third.

Around the seventieth copy, though, there were twelve differences.

Around the hundredth there were thirteen.

By the time that machine ran out of toner, some eight hundred and fifty copies later, the page that Royce had brought with him was no longer even in the same typeface as the original, and thirty digits, out of three thousand, were different.

To Royce, the one he had brought had not changed at all, but the others had.

To Hammond, the one Royce had brought had been steadily altering, while everything else remained constant.

And it wasn't just the paper; Hammond's mustache had disappeared, Brzeski had changed his shirt and shaved, and various other things had altered over time, while to the scientists none of these had altered, but Royce had —his clothing and hairstyle were no longer what the physicists remembered from before the experiment.

It was Brzeski who finally came up with a theory to account for this, and explained it to Royce.

"Think of all those universes we talked about as parallel lines," he said. "And each version of you is like a ball rolling down the line, from past to future."

Royce nodded.

"Well, we had thought of those lines as little grooves, and we were going to nudge you up out of one groove and into the next."

Royce nodded again.

Brzeski grimaced. "It seems we got our analogy wrong, though; they aren't grooves, just lines on a flat surface. We gave you a push sideways, and you moved off your original line—but instead of dropping into the next groove, you've just kept rolling across the surface, from one line to the next, at an angle. There are no grooves, nothing to stop you from sliding on across the different lines forever. You have the same futureward vector as you started with, but you've added a small crosstime vector, as well."

"So how do I stop it?"

Brzeski shrugged. "I don't know," he admitted.

Royce stared at him.

"There may be friction," he said. "In fact, there probably *is* some sort of friction, because after all, you interact with your surroundings—we gave a crosstime shove to what was in the sphere, and that's just a finite mass, made up of you and the notebook and a lot of air and miscellaneous particles, which means a finite momentum; as the molecules of your body are replaced with molecules that were not in the sphere, that momentum will be dissipated, and your average velocity as a system, if we can call it that, will be reduced. We have no way of measuring the reduction, though, no way of knowing when it'll slow you down to a stop."

Royce was glad that Physics 101 was a course he had *not* flunked—he thought he understood this explanation. "Well, can you put me back in the machine and shove me back the other way, cancel out the momentum?" he asked.

Brzeski hesitated before replying. "No."

After a moment he realized that wasn't adequate, and explained. "We can't aim the thing; in fact, I think it's stuck pointing in one direction, so to speak. If we put you in again and shoved, it wouldn't slow you down, it would speed you up. Didn't Hammond warn you about that, that we didn't think you could ever get back to your home universe?"

"Yeah," Royce admitted. "He said something about that."

"We'll work on it," Brzeski assured him. "Hang in there."

"Yeah," Royce said. "But how long is it going to take? Am I stuck here until you get it worked out? So far all the changes have been stupid little stuff, but what happens if something *important* changes? How often am I going to make these hops from one universe to the next?"

Brzeski swallowed. "I thought you understood," he said. "You're making hops, as you call it, *constantly*, every second, every instant. You're not in the same universe you were in five minutes ago, or ten seconds ago, or even when I started this sentence. You're falling, or rolling, or however you want to describe it, though one universe after another—but the transitions are instantaneous, and the differences are so minute and so scattered that you don't see most of the changes. The population of China could have gone up or down by a million in a single transition, and you wouldn't know, because it's outside your immediate area. Whole planets could vanish or appear, and you wouldn't notice. There must be millions, billions of changes happening every second, for there to have been any you observed directly in the" —he glanced at his watch—"nineteen hours since you got your push."

Royce puzzled with this for a moment, then asked, "But then how can you talk to me? How can you even *see* me, if I'm only in your universe for an instant?"

"Because it isn't just a single you," Brzeski explained. "There were an infinite number of closely bunched worlds where this experiment was tried, where you were the subject, and where the results were the same. That means an infinite number of worlds." He sighed. "Think of two sets of parallel lines, set at an angle, crossing each other. The intersections of the lines form a line of their own, and *that's* the line we're interacting along. You aren't the same Dave Royce that I started explaining this to; you're just one of millions who have flashed through this universe, and millions of adjacent universes, each of you hearing an instant of this in each of those different realities."

"*Danny* Royce," Royce said, "Danny, not Dave."

Brzeski blinked, and looked down at his notes.

"The one we started with," he said, "was Dave. See?" He held up a sheet of paper, and Royce read the line near the top: "Subject volunteer David H. Royce."

A chill ran through him.

"So there are a million of us," he said. "Can you stop us, somehow? Or tell where we're going?"

Brzeski shook his head. "No," he said, "All we can do is hope that I'm right about friction slowing you down."

They tried anyway, of course; they measured everything they could think of to measure, ran dozens of computer models, considered a hundred different ways to recalibrate the gadget.

Nothing held out any hope. For weeks, he lived in an uncomfortable world of constant small changes, a world all his own, moving at an angle to everyone else. Small objects moved about untouched, sometimes hopping instantaneously from one place to another as he watched; people did the same. Hair, clothing, and makeup could change at any instant; conversations sometimes shifted directions in the middle of a sentence, or even a word.

And then came the day when he woke up on his cot in the basement of Palmer and found two people sitting nearby—not Hammond and Brzeski, but Hammond and Dave Royce.

He had reached universes where the experiment had not been done, where no one had volunteered; Dave Royce, who was otherwise almost indistinguishable from Danny Royce, had considered it, and had backed down.

"You first appeared—that is, your analogues did—about six weeks ago," Dave explained. "It was pretty weird; at first everyone thought I had a long-lost twin brother turning up. Really gave me the creeps, seeing you."

Danny, staring at his doppelganger in uneasy fascination, shuddered slightly and said, "I can understand that."

"Before you bother to ask—I mean, I guess you will, because all the others did, practically every five minutes —we can't do anything to stop your crosstime drift. Things are different here, yeah, but that's because the experiments didn't go as far as they did where you world. The equipadget got built, here, but I didn't volver tried it out on humans."

Danny blinked; the conversation was fragmenting more than usual. Perhaps that had something to do with being near a major transition, between universes that had done the experiment and universes that hadn't. There was no pattern to the changes that he could detect, but they did sometimes seem to come in bunches.

Then Dave was gone, and Dr. Hammond was saying, ". . . six weeks to study your situation, but as yet we haven't made much progress."

Then Dave was back.

He lived in the basement for another week. He no longer had a room, of course, since in these universes it was Dave Royce, not Danny, who was a student on the verge of flunking out. Danny Royce didn't exist at all, or at any rate had not existed prior to six weeks before.

The one encouraging piece of news, received in a rather fragmented conversation with Dr. Brzeski, was that his situation might actually have been improved by this doubling-up.

"In all the universes where a Dave or Danny Royce was sent out," Brzeski explained, "that created a sort of vacuum, we think, that all the others, coming up behind, can move into easily. This may, in fact, be one reason why you're moving far more quickly than we would have expected—only the very first in the sequence had to overcome any significant resistance. Now that you're into universes where this didn't happen, though, friction should be much greater."

Royce frowned. "But I'm still following seven weeks' worth of myself," he said. "Aren't they all pulling me along?"

Brzeski frowned and scratched at his beard. "Maybe," he admitted. "But not as much as they were, I don't think."

Before Royce could say anything, the tail end of another conversation intruded, as Brzeski said, ". . . your best chance."

"What's my best chance?"

"Waiting it out," Brzeski said, "I just said looks bad, and I wish I could be be be be more timistic."

"What looks bad?" Royce hated this sort of thing, where attempts to communicate went into bizarre and unexpected directions without warning.

"Your situation. I mean, with the dead ones."

"Dead ones? What dead ones?"

Brzeski sighed. "Here we go again. I was explaining, for about the hundredth time, that the first few of you to arrive in our universe were dead. We don't know what killed them. It scared the hell out of us when the first live one arrived—having a dead body appear in the physics lab was bad enough, but when it sat up and started asking questions . . ."

Brzeski vanished.

By the end of the third month Royce was absolutely convinced that the changes were speeding up, not slowing down; the friction theory didn't seem to be working.

Dr. Brzeski no longer existed; the physicist with the Middle Eastern name was now Dr. Hamid, which Royce was fairly certain was not what he had heard originally; Douglas Royce had not been admitted to the university, but had been wait-listed and not made the final cut; no Dave or Danny Royce had ever existed, prior to some forty days ago. The gadget had not been built; Hammond's work in parallel-world theory was entirely theoretical.

The fact that it was no longer six weeks since the first appearance worried him.

Then he found out about the body.

Or bodies.

"We don't understand what's happening, exactly," Hammond explained, "but dead bodies have appeared in the basement lab, and then disappeared again, and sometimes this coincides with a live Royce, and sometimes it doesn't."

"A live Royce?" Royce asked. "You mean there's more than one?"

"I mean that you appear and disappear, and even when you're here you flicker sometimes."

Royce could understand that; he had sometimes seen other people flick about, or blink in and out of existence. He had not realized that he was doing it.

Upon consideration, though, he thought he could explain it. He was becoming an expert on the practical ramifications of crosstime travel, from first-hand experience combined with an urgent personal interest. Some of his other selves were diverging slightly as they moved through time. Some had died, some had moved about in different ways.

And the existence of more than one at a time—that needed more thought, but he had a guess.

"It's friction," he said. "When I move, and eat, and breathe, I interact with the air around me, and so on, and that increases the air resistance, sort of. Not air resistance, exactly, but . . ."

"Temporal resistance," Hammond suggested.

"Temporal resistance," he agreed. "So when some of me stop eating and breathing, or do so differently, then that changes the amount of resistance they encounter. So dead bodies ought to be moving faster across time than the live versions." He considered that. "So they're coming from behind me," he said. "I've slowed down more than they have, and they've zipped past me."

He looked at himself for a moment, and then the duplicate was gone again.

"And I'll bet we're bumping against each other, too," Royce said. "Some of us would be slowed down by collisions, and some would be sped up—whole chunks of the sequence, millions at a time. That would account for some of the flickering, too, as we get spaced out further. My part must be speeding up a little, because the changes have been coming more quickly for me. But it means there *is* friction, and so eventually I'll come to rest. Right?"

"I'm sorry," Hammond said, "but I couldn't make that out; your speech is deteriorating."

By the end of the first year, no Dr. Hammond or Dr. Hamid had ever existed, and no one he spoke to knew anything about any serious study of parallel-world theory. It was purely the province of science fiction writers. He could find no Doug, Dave or Danny Royce anywhere; his mother was not living in the house he had grown up in.

The world wasn't all that different, though. The United States was still there; history seemed unchanged in any significant way; the university was still there, though

one quadrangle was drastically altered; he supposed a different architect had done it.

He survived by sleeping in campus lounges, eating anywhere he could sneak in, doing odd jobs for cash. He could no longer chart exactly how long his doppelgangers had been appearing, because appearances were scattered in both time and space. Mysterious corpses appearing and disappearing had been a frequent phenomenon in these worlds for months.

He tried to count changes as best he could, but had no real way of doing so. Whether he was speeding up or slowing down he was not certain.

For three days, he found himself passing another section of the sequence, and the two versions of himself were able to compare notes, but nothing came of the comparison. Danny Royce was clearly drifting faster than Dave Royce in this particular pairing, which Dave found heartening and Danny depressing, but beyond that he learned nothing of any use,

In the third year he was caught by troops enforcing a curfew he hadn't known about, and was shot while fleeing; he heard the rifle crack, saw the bullet coming toward him, and then it was gone and he ran on.

One of his doppelgangers was dead, killed by that bullet, he was sure; probably millions were dead of millions of identical bullets. He, personally, was not.

His sense of self had suffered over the past two years; so had his grip on reality, since reality kept changing. The university was gone, the United States in the chaos of a second civil war that had begun twenty years before, and he knew nothing of it. Still, he knew that he was alive; he was not so far gone as to doubt that.

From then on, though, he found people starting at his appearance; he was frequently asked, "Where'd you go?" or "Where'd you come from?" and concluded that there was a gap in his existence now, a space of several seconds.

His life had become sufficiently disjointed that he no longer looked for any way to slow his drift; he only worried about surviving from one meal to the next, while waiting for friction to stop him.

It was a relief when he finally found himself in uninhabited forest. He had been avoiding people for years, ever since English had ceased to be the local language, and the utter absence of other human beings made that much easier. He could concentrate on finding food and water, without worrying about hiding—fortunately, the local predators, bears and mountain lions, didn't seem interested in him.

He sometimes wondered whether he had reached a world where human beings had never existed, or one where they had died out, or one where they simply hadn't found the Americas yet. He rather hoped it was the last of those three, because once he was sure he had stopped drifting he intended to try to find a human society where he could fit in. He was lonely. It had been thirteen years since he had stepped out of that metal sphere, thirteen years since his life had had any pretense of normality.

He knew that he had not stopped yet, though, because every so often, perhaps once a week, or only once a month, something would change—a rock would be shifted, a branch unbroken, or some other sign that reality was still not constant.

With no one to talk to, he had no idea whether there were any of his other selves still in existence, but he theorized that there had to be.

He certainly hoped so.

The child stared, and called for her mother. She came quickly, and together they gazed down at the huddled shape.

Royce awoke on a comfortable object—he had no name for it, though it was obviously furniture, something akin to a large beanbag chair, and also to an oversized pillow, but not quite either one. He looked up at an arched, sand-colored ceiling.

He stretched, sat up, and looked around.

The mother and daughter were standing in the doorway, watching him.

He smiled, then thought better of showing his teeth—twenty-two years without a dentist had left them in sorry shape.

"Hello," he said, his voice cracking. "I don't suppose by any miracle you speak English?"

The pair simply stared.

Royce shrugged. "I didn't think so," he said. "So I'll learn your language. After all, I'm going to be here for a long time." He smiled again, keeping his lips closed this time. "You're probably wondering where the hell I came from, and I wish I could tell you; maybe someday I'll be able to explain it." He looked around the room, at the oval window and the various inexplicable furnishings. "So this is your village, huh? I've been watching you guys for months—I mean, I didn't want to just walk up and get a spear through my belly, or wind up in the community stewpot, you know? I guess I misjudged a little, though. You must have found me asleep, right? I thought I was farther away than that." He grimaced.

The silent watchers listened to the stream of strange, babbling noises from the creature, but made no response.

"And I've stopped drifting, haven't I?" Royce said, unable to repress a grin. "It's been six months since I spotted any changes, and believe me, I've been looking. God, it was *so lucky* that I made it as far as you folks before I stopped! Living the rest of my life alone out there in the woods—well, I'm not as young as I was, y'know? And even though you people aren't anything like where I came from, I like your looks." He waved an arm at the room and its contents. "I like this place. Homey."

The daughter squeaked at her mother, who honked a reply. A yellowed claw patted the daughter's scaly head.

"That's gonna be a tough language to learn," Royce said, considering.

Then, before the eyes of the two observers, he vanished. ✦

Chapter Thirteen

Illustration by David Deitrick

Phillip C. Jennings

Arriving early at her lectern, Professor Kain had nothing much to do, just watch the young crowd file through upper doors into the back of Science Hall A. Those already seated watched her in return, or chattered, or tiepatched briefly into MTV: MTV or news, since the news was so close. Six days after the months-old rumors proved true, state police had shut down Interstate 94, cutting off everything west of Fergus Falls. Zoologists continued to rush to Minnesota from all over the world—fools! Fools! As if anything but theoretical physics could explain dragons

in Ottertail County, nesting a few miles from her own lake cabin.

A mating pair, precious but lethal, swooping down on isolated subcompacts; leaving freeway convoys alone. *Precious? Endangered,* certainly. They'd be riddled by vigilante bullets if not for the conservationists, and experts debated whether they should be left alone to hatch their eggs.

Their nest was armored with car debris and old farm equipment, like a junkyard castle: channel 11 had pictures. The experts wondered if they were just cunning, or actually intelligent. Fools! But she'd out-dragon them all! To conceal her predatory excitement, Professor Kain shuffled through the pages of her lecture, marking her speech with exclamation points.

Physics 101. Bonehead Physics. Again she looked up. Two vidcams stood in the front row—it was Dr. Husman's anal-retentive policy to record everything done in Science Hall A, on the assumption that words spoken to classes of five hundred must be important. Years from now, a collection of tapes could teach Bonehead Physics. The department could retire further into research, shielded from so many parka-clad, book-dropping, chair-scraping, snow-dripping freshmen and sophomores.

Lit majors. Music. Knowing hardly any names, Kain classified her students by body type, rejoicing in their diversity. Those extra-robust females? Art or Social Studies. That death-row felon? Philosophy.

It worked in every case but her own. Physically Kain was a political scientist of the Kissinger breed: a painted tan, bushy eyebrows, on the stout side, straining feistily for a height beyond her inadequate five-three. Politics—maybe that was her fate. What had physics given her but a third-rate job in a boondocks university, and a relationship so tepid that Bill just—*mosied off*—to that post in Bozeman? Her curiosity was satisfied, the kind of cosmic curiosity that could be answered by an equation, at least. Soon she'd rule her bit of humanity, learning poly-sci on the fly, and if she did well she'd be remembered in legends as the Great Foundress.

Kain looked at her watch. Bells rang. The noise reached a crescendo. Enough. She tapped her lectern's mike. "Did everyone bring graph paper, as I told you on Tuesday? Please take a sheet, and draw X and Y axes."

Laptops slapped shut as students reverted to paper. Kain had to demonstrate X and Y to the Lit majors, carrying her notes to the blackboard, knowing what she looked like as she moved out of concealment: an academic tootlebug in eccentric high heels. She wielded her chalk while the last malingerers found their places. Science Hall A grew quiet, as if God had twiddled down the volume.

Kain's voice carried despite her distance from the lectern. "The X axis represents space. The Y axis is time. It's a matter of controversy whether this X and Y are called *imaginary* space and time, or *absolute*." She paused and repeated: "Imaginary or absolute. But I'll never call them *real* space or time, because that's something else. Let's keep our adjectives straight. That's half the purpose of a college education."

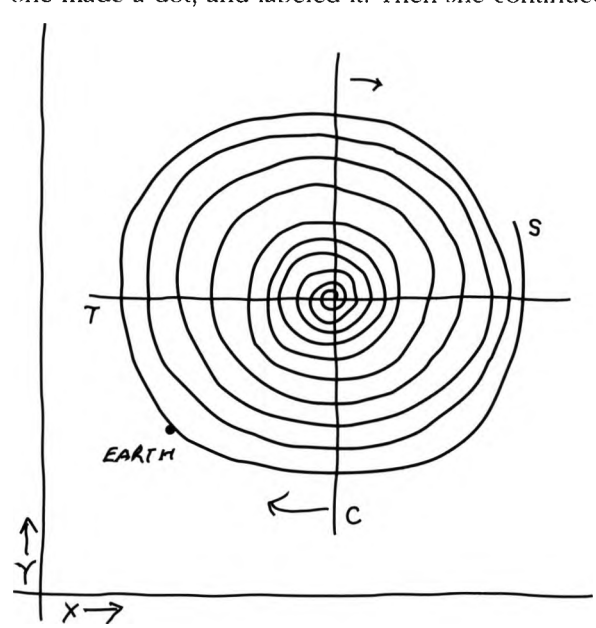
She raised her focus. Outside the building, snow fell past the high windows in the back wall, so high they were almost skylights. Not a big storm, no power interruptions expected, thank God. An outage would blow everything. It would change history. In the basement, computers performed silent calculations. Mass sensors fed in numbers, and robot arms torqued the metal walls of a passage rigged inside old steam-tunnel C. And Meg, Professor Kain's most submissive grad-student slave, kept vigil inside a locked security door.

Kain cocked her head, hearing the whisper-buzz of those who recognized that she'd abandoned her 101 syllabus. This absolute-versus-real business had nothing to do with Chapter Twelve—was she skipping ahead?

She spoke on; short phrases between bursts of blackboard exercise, pleased that her tight jacket kept her triceps from wobbling. "Okay, let's move to the plus-plus quadrant, this northeast quarter of our diagram. Pick any arbitrary point and draw a spiral outward." She worked as she talked. "Then use a ruler to draw a line T representing some moment in absolute time—parallel to X at right angles to Y. Every instance where the spiral crosses your ruled line is an elementary particle. *The* elementary particle. The *only* elementary particle, over and over again."

A radical claim, but not enough to fire her class. They needed what Physics 101 could not give, a dose of mental oxygen. Stimulation. Not enough dragons in their world to keep them hopping. But that would change. Professor Kain smiled. "Remember where you began that spiral? Draw a vertical line C through your starting point. This is the center of the universe. Your spiral is a clock face, and in this center is the point from which the hour hand rotates, and you've drawn noon-to-six. Imagine hour hand C ticking along until it reaches nine o'clock. What's portrayed in that motion? The expansion of the universe to its ultimate size! Which puts planet Earth right on the rim of your spiral, between seven and eight o'clock!"

She made a dot, and labeled it. Then she continued



her lecture, touching on antimatter. Touching on the tachyonic embryo. Touching on the curvature of *real* space, versus the flatness of *imaginary* space.

"I'll make it simple. Point in any direction, and you're pointing toward the center of the universe, toward that noon-to-six line. The place where the Big Bang banged. Equal radio noise everywhere. Think of it as if you were looking through a lens. Think of it as distortion. But is it distortion, or not?"

Professor Kain wished she were bold enough to strike a Mad Scientist pose. She was talking about her detractors now; the orthodox scoffers, fussy pedants like Dr. Husman. "They didn't used to think it *was* distortion. Real space *really is curved. The center is the periphery*, and the periphery? Well, that's us on the outer edge. Except ninety percent of the matter in the universe is missing. It isn't between us and the center. Where else could it be?"

The class gave a collective mutter-shrug. Kain waited, having done her best to build a word-bridge across the chasm between her and these undergraduates. Was it good enough? Had she reached them? "Say it!" she ordered. "You can't point in that direction, but you can say the words!"

The Philosophy felon spoke up. "Further out? You could keep drawing the spiral bigger and bigger so Earth isn't on the rim—"

"Out to an outer world where they can see us," Kain interrupted, "because we're between them and the center. But we can't see them!"

"That doesn't make sense!" A Lit type spoke for logic and reason, all red hair and freckles; Kain had glimpsed him earlier that week, playing cards in the Goal-Line Grill. "I see you, and vice versa, so—so we're both on the rim of the spiral, and looking centerward at each other? How does that work?"

"You get an A," Professor Kain answered, thinking: *Your bridge partners will miss you.* "I hoped someone would object, but you've done it so intelligently that—well, here's the explanation. We talk about the speed of light as fast, but light moves so slowly that the viewer always exists in an older, more expanded universe than the viewee. Whether one of us is on the Moon and the other on Mars makes no difference.

"What might make a difference is if one of us is accelerated past the speed of light," she elaborated. "But if we could cross the light-speed barrier, and enlarge our visible universe, what method would we use to *shrink* our universe, moving toward the center? *De*-acceleration? In what way, measured against absolute space and time, can we distinguish acceleration from deceleration?"

Dramatic pause. She had actually written those words: *Dramatic pause.* "You can't!" she told them. "Given the curvature of real space in the universe, everything will be interpreted just one way."

Professor Kain shot a Kissinger-smile at one of the vidcams for the sake of posterity. "Transcending the light barrier always shrinks the visible universe. Those who make this centerward hop lose the place they hop from. The missing universe interacts gravitationally with what remains, but otherwise it's gone.

"Don't worry. It's impossible to accelerate past the speed of light, which saves us from that fate. And until these last weeks, no one has explored the opposite possibility, because the curvature of space makes it hard to find any meaning for the phrase: *the opposite direction from the center of the universe.* We're treading close to mysticism here."

A few students laughed, expecting a professor-joke every ten minutes, and interpreting this as their due. Kain took a deep breath. She spoke differently now, less a pedant, and more like—well, one of those channel 46 televangelists. "But here's the payoff. If, by cracking our brains, we come up with a *thing* to go with our *phrase,* we might be rewarded to discover that it's not impossible, nor even very expensive, to energize in that direction. All we do is take a few steps in absolute space, along a tunnel shaped in perfect defiance of the curvature of real space."

This was a simplification so gross that it might better be called a lie, a damned lie at that. Professor Kain had taken her own significant step. She was no longer acting as today's lecturer in Bonehead Physics. *Off the payroll, and into the history books!* "I want to show you something. I'd like everyone to pack up, and follow me. Enough of theory. It's time for some show-and-tell."

A moment of shock, a buzz of excitement, and then they stood and followed, clamoring down two aisles toward her podium, and toward the back door. *Like a waterfall. Like a river of humanity. Five hundred of them.* At least two hundred brood-pairs! The thought reminded her of two nesting dragons, huddled miserably against the Minnesota cold a couple hours away.

She waved the first bunch through, then moved out to the corridor, nodding them toward the basement stairwell. The rest would know where to go, and if a few went AWOL there wasn't much she could do about that. "This missing matter business," she puffed as she clattered down the stairs, the only one in these hundreds to be handicapped by heels. "If it lies outward from Earth, that doesn't mean we're talking about other stars and planets. *Outward* doesn't mean outward!"

The dozen who heard fell silent to listen, slowing to her pace. She reached the security door. "We could say that the Earth has its full quota of *gravitational* matter, but only"—Kain palmed the door open—"ten percent of its *structural* matter. So moving outward takes us to an Earth that has exactly the gravity we're used to, but a tad more structure. It would be bigger in diameter—"

The trailing crowd made too much noise, muffling her words. This was exciting. This was an event! A physics prof was going to show them—a cyclotron or something!

Hemmed by computer consoles, bookshelves and cables, they reached the mouth of the unnaturally dark passage. "—so we're Earth Ten Point Zero, and this is the road to Earth Ten Point One, whose history is identical to ours, at least gravitationally, but different *structurally* . . . different continents . . . islands . . ."

Professor Kain's voice trailed off as she stepped into the passage. Overshoes drummed along its warped metal floor: students shuffled after her in bemused curiosity,

elbowing and joking. Meg rose from her swivel chair and waved the direction as more students came through the room, successive clots of sophomoric loudness. They came spaced further and further apart, the last bunch punkishly cool and in a world of their own, a world soon to be superseded. Then—finis.

The experiment was a success, or there'd be no more room for the last crowd in the passage. It really wasn't all that long. Meg plucked thoughtfully at her pursed lips. Was Earth Ten Point One inhabitable? Did it have life? An oxygen atmosphere? In theory, yes. But there was no way to know. No way to come back, because it was impossible to exceed the speed of light.

Five hundred people: vanished. Their fault. They'd gotten a halfway fair warning, if they'd bothered to think. But with Professor Kain gone too, today's events put Meg in an awkward situation, legally speaking. Did the outside world expect students on fellowship grants to have wills of their own? To refuse faculty orders? She sat to ponder, made note of the time, and waited for someone to make inquiries. A curious coven of deans, perhaps.

She might point them into the passage. Or she might tell them where dragons came from. About some physics department on Earth Nine Point Nine. "But just two dragons came through to our world?" they'd ask.

A grad student's brief moment of revenge. "I'd say their experimenter was just a tad more ethical than ours." ✦

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Wacky Jack 5.1

Illustration by John Rheaume

W. R. Thompson

"Incoming!" McGrath shouted. "Take cover!"

The camouflage went to full-burn as the German missile whistled in. Gunnery Sergeant McGrath's uniform glowed brown and tan, matching the autumn colors and light-levels of the Ardennes forest. He felt heat on his face as somebody fired an infrared flare to further confuse the missile's sensors.

The engine-whistle grew louder and he saw the missile high in the sky. There was gunfire, a quick snapping as somebody got off a couple of rounds at the bird. At once the missile jinked to evade the smart bullets. Halfway through its turn it

realized it was caught; the bird plunged into the ground a quarter-mile behind the squad.

"A dud," one of the skaters said. Laine laughed and switched off his camouflage, turning his uniform back into Marine olive drab. "You gotta scare us for duds, Gunny?"

"Dud, hell," McGrath said. "It buried itself. Finn!"

"I'm on it, Gunny." Lance Corporal Finn was already shucking her backpack computer. She sat down on a log and balanced the unit on her knees. Like all military equipment the computer was a rugged, bulky thing, but then, so was Finn. She handled the unit like a toy as she worked its keyboard.

While Finn did whatever it was poindexters did with their computers, McGrath signaled the squad to take a break. Skaters and spikers sat down under the trees, glad for a rest. Ever since the German lines had crumbled two days ago, the First Marine Division had pushed east as fast as legs could carry it. There had been a time when Marines used tanks and trucks and jeeps, but modern weapons had grown so deadly that vehicles were nothing but death-traps for whoever rode them. Survival depended on not attracting attention, and vehicles made big, attractive targets.

The sergeant listened to his people shoot the breeze as they rested. They sounded easy and confident, which wasn't a bad thing. McGrath knew they felt good because they trusted him, Wacky Jack McGrath, to keep them alive. Thirty years in the Corps had given him a large bag of survival tricks, and no machine could beat that.

"I got numbers, Gunny." Finn did something that changed the heads-up display in McGrath's helmet. A holographic map glowed before his eyes, showing terrain, towns and roads. A red X flashed on a road. "I figure the missile buried itself in the middle of that freeway. It's got the highest point-value of anything around here."

"Except us," McGrath said. "Mechlin!"

Fifty yards away the communicator stood up, his light-thread drooping behind him on the forest floor. "Yo, Gunny!"

"Quit saying 'yo,' you idiot," McGrath said. "Call headquarters and tell them there's an unexploded bomb in the Liege-Metz highway near our coordinates."

Mechlin got out his phone and called in the data. We'd better get resupplied soon, McGrath thought, looking at the spool on the communicator's back. A full spool carried over sixty miles of fiber-optic cable, but most of the thread was gone. When it ran out, McGrath's platoon would either have to stop its advance or break the connection to headquarters and press on in silence.

Or use the radio, said the corner of his mind where he kept a grim sense of humor. He could make a report on the radio, and while he was doing that some German missile would home on him and blast him to hell. The sergeant had to wonder why the Marine Corps still issued radios to its combat troops. Nowadays you relied on the computer-adjusted sound amplifiers in your helmet, which let you carry on a near-normal conversation at a distance of a mile. The Germans hadn't found a way to turn that against their enemies, at least not yet.

"Okay everyone, saddle up," McGrath ordered, after Mechlin had finished reporting. "We gotta be in Bovigny by sundown."

"Gonna follow the road?" somebody called. McGrath didn't recognize the voice, so it had to be one of the new replacements, either Nelson or Shipler. Only an FNG was dumb enough to suggest something like that.

Laine's thoughts paralleled McGrath's. "We stay off the roads," he said. "You get nailed on the roads. There's no cover. Don't they teach you effing new guys anything?"

"'Effing'? *'Effing'?*" one of the skaters asked. She shouldered her load of skate missiles and laughed. "What would your momma say if she heard you talk like that?"

Laine snickered. "She'd say I shouldn't talk dirty around a virgin like you, Cortez."

McGrath took the point as the squad moved out. The squad kept bantering, and McGrath found himself recalling his first battle almost thirty years ago. Grenada. He'd been a nineteen-year-old boot Marine, and his squad leader had promised to shoot any gomer who made noise on a patrol. Don't draw fire, that had been the word. Nowadays there was no point in silence, not when everyone had sensors that could pick up the lightest footfall at a hundred yards. McGrath knew for a fact that some computer in Berlin was taking sensor data and tracking his every movement, and if the machine figured the odds and cost-ratios were right it would order a missile or something fired at him.

War, McGrath thought. Computers ran the whole show. Computers were everywhere, at headquarters, on your back, in your helmet and bullets, even in your clothes. Computers decided which targets to hit and which ones weren't worth the cost of a cybernetic shell or bullet, and what was the best way to protect you against other computers. Computers did everything for you except the fighting and the dying. Sort of like politicians, he thought.

The squad trudged up a slope. Most of the grunts had enough smarts to keep strung out, but Nelson and Shipler were drawing together like magnets. Their blips almost touched on McGrath's heads-up display. "Nelson, Shipler, keep your interval," the sergeant told them. "You wanna draw fire?"

Shipler laughed. "Hell, Gunny, back in basic they said we can't get hit in the woods. The branches confuse the missiles."

"That was last month's missiles," McGrath said. "If you two don't stop this hand-holding, you're gonna go home in the same body bag. Spread out."

By the time the unit neared the crest of the hill, Shipler and Nelson had separated. McGrath halted the squad just short of the crest, while he crept forward and peeked over it. He looked down into a wide valley, just like the last one, but with fewer trees. He could see a village in the distance, and a two-lane road. If there was anything active down there his sensors couldn't spot it. "Is that Bovigny?" someone asked.

"Yeah," McGrath said. Bovigny. The name glowed in

his helmet display, the letters in sharp focus over the village. More letters said it had no military-industrial value. Just a place where people lived their lives, he thought. "Finn, take a look and give me some good numbers."

"Right, Gunny." She sat under a tree and got out her keyboard. Chunky, McGrath thought, but maybe she'd been good-looking before she went through boot camp, where she had bulked out on steroids. McGrath didn't like some of the things they did to recruits these days, but as everyone kept telling him, there was a war on. Combat troops needed stamina, and too many geniuses started out as runts. The need to make their muscles as strong as their brains justified taking chances with their health, because you sure as hell couldn't fight today's war without poindexters.

McGrath shook his head. He tried not to worry about things beyond his control, because he had to give his attention to keeping his people alive, and he only had so much attention to spare. He left the big questions to the higher-ups; a soldier had to assume that they were making the right decisions for him.

Finn gestured to McGrath. "It's not bad, Gunny," she said. "Open up our interval to one-five-oh yards and we're safe."

"How safe?" McGrath asked.

"It's even money we all get to Bovigny alive. Our route . . ." Her computer put new lines in his helmet display, overlaying the scenery. "We play connect-the-dots with those shrubs out there."

"I guess they're the best cover we have," McGrath said. "Okay, people. Single file, hundred-and-fifty-yard interval. Cortez, take the point."

"Right, Gunny." A quarter mile to McGrath's left, Cortez stood up and moved out. The rest of the line shifted sideways, snaking along to follow the designated path.

Hell of a way to run a war, McGrath thought. Modern weapons were so damned deadly that you had to spread out to the point where a squad covered a front a mile long, and a single division fought along a front some two hundred miles across. The entire war in Western Europe was being fought by three Allied and two German divisions, a far cry from the hordes who had fought in earlier World Wars.

The press and the politicians thought that was wonderful, because the low numbers meant only a score or so of soldiers died on any given day. That meant nothing to the troops at the front, however, because the odds still came out against them.

The odds held, and the squad reached Bovigny without incident. The western quadrant of the town was in ruins; a German grenadier had made a stand here, and the Marine divisional artillery had spared no effort in penetrating his countermeasures and rooting him out.

McGrath picked out a small wooded area, and they dug in for the night. The spikers set up the perimeter, planting their weapons in the ground; McGrath's helmet display told him that the spikes could sweep the entire perimeter with their lasers and smart bullets. One of the poindexters set up his jamming array and tested it while everyone else dug foxholes, and then Finn checked the numbers and pronounced the area secure. McGrath assigned sentries for the first watch, then settled down into his foxhole to have dinner.

Finn joined him as he finished the last of his canned nut roll. "Mind if I ask you something, Gunny?"

He waved his fork. "Go ahead, kid."

"How'd you get a name like Wacky Jack?"

"You don't like my name?" he asked. He couldn't blame her if she didn't. *Wacky Jack* was Marinespeak for a grunt who did crazy things in combat, things that were liable to get himself and his teammates killed.

Finn took off her helmet. She had thick, shiny black hair, McGrath noted, cut short in accordance with combat regulations. "Well, Gunny, we've walked all the way from Bordeaux and I haven't seen you do anything crazy."

McGrath snorted. "'Course not. We're in a computer war. If I turn wacky, I'll screw up our chances. You can do the unexpected against humans, but not against computers. Not any more."

"I know, Gunny." She seemed to settle down in the foxhole. "Anyway, how'd you get that name?"

"From my platoon sergeant, back before we hit Grenada. I'd just joined his platoon, and that's when I found out he liked to give everyone nicknames."

"Good ones?" Finn asked.

"No, cabbage-head stupid ones. The platoon had a Dangerous Dan and a Pistol Pete and a Tricky Dicky. My first name is John, but he couldn't bring himself to use that. The jerk had already used Black Jack and Jumpin' Jack Flash, and I guess Wacky Jack was next on his little list."

Finn looked sympathetic. "And the name stuck."

"Worse," McGrath said. "I started living up to that name, almost in spite of myself. Like this one time in Libya, when a sniper opened up on my platoon. He got three guys in two minutes, and we couldn't spot him, so I wrapped myself in body armor and stood up to draw his fire. He musta noticed the armor, because he held back. I'd learned how to cuss in Arabic, so I started shouting things about Khadaffi Duck, and that blew his cool. He took a shot at me, and someone spotted him and zapped him."

"That *was* wacky," she agreed, visibly impressed.

"I guess so," McGrath said. "Seeing my guys get it always gets to me." He felt annoyed with himself for not coming out and saying "dying," but you didn't use the D-word in polite company, such as your fellow troops. "Anyway, don't *you* ever do anything wacky, Finn. There's an art to knowing just when you've got to risk everything, and I don't think you have the art yet."

"I know, Gunny," she said. Finn went back to her foxhole.

McGrath curled up to sleep. He wondered if he should have told Finn about the advantages of a name like Wacky Jack. Officers usually cut him a little slack when he did something wild. Like at the camp in England, a month before the invasion. Some airhead of a morale officer had arranged a showing of *Rambo on the Rhine*. That had been the last thing the troops wanted—

Hollywood heroics, white-haired Stallone giving crap speeches about the war, soldiers dying neatly and painlessly. The audience had cursed and snarled at the hype, which even the rawest recruit knew had nothing to do with real war. Finally the morale officer had stood up and threatened to put everyone in the theater on report.

That was when Wacky Jack took over. McGrath had brought along his sidearm, and Wacky Jack stood up and emptied the pistol into the screen, shredding it with high-explosive bullets. All at once the morale officer forgot his outrage at the theater crowd; he was too busy having McGrath arrested to go after the other troops. It had looked like Court-martial City for a while, but then the division's commanding officer had dismissed the charges. What else could you expect from a guy named Wacky Jack? she had asked the morale officer, and had thrown McGrath a wink.

McGrath dozed off, and was killed in his sleep.

He woke up in a place that sure as hell wasn't hell, or heaven, or a field hospital. All he could see was a wall that looked like part of an electronics shop, with shelves of testing gear, assorted wires and black boxes. McGrath tried to ask where he was, but his voice wouldn't work. Ditto his hearing and sense of touch. Something must have happened, but he couldn't recall anything special. He felt very calm. Drugs, he figured. He tried to remember getting hit, but the last thing in his memory was the taste of nut roll on his teeth as he went to sleep.

His hearing returned in a click and a hiss of static. "Sergeant McGrath," a voice said. It had the ring of an officer's voice, although he couldn't see the man. "Can you hear me?"

McGrath found his voice. "Yes, sir. Where am I, sir?"

"In New Mexico. The Sandia Lab."

A lab, he thought. He had to be in a bad way if he was in a lab instead of a normal hospital. Then the important things came to him in a rush. "What about my unit? Who else was hit? Who's taking care of my squad?" Don't let it be Mechlin, he thought. Mechlin didn't have what it took. Let it be Finn. She had lots of sense.

"I don't have that information, Sergeant."

"Could you find out, sir?" When there was no answer he tried to sigh, but nothing happened. "How long have I been out?"

"Almost three months. How do you feel?"

"Mostly I don't." Well, he knew what that meant. "I broke my neck, didn't I?"

"How do you feel about that?"

If they gave medals for dumb-ass questions, McGrath thought, this bird would probably have a chestload of them. "I don't like it."

A new voice spoke. "Okay, Major, we can live with that. We're ready for phase two."

"I'm still not sure we debugged everything, sir," the first voice said. "This simulation seems to function better than the last four versions, but—"

"If it crashes again, you can reconfigure and reboot. Deactivate it for now."

"Okay." Something happened that made McGrath feel like he was being sucked down a kitchen drain. Then that was over and he was looking at the shop wall again. "Gunny?" a familiar voice asked.

"Finn? You here too, kid?"

"Yeah."

"I can't see you. You okay? You must have got hit, too."

"I did, the day after you. I wasn't as lucky as you."

Her tone told McGrath to drop that subject. "What hit me?"

"An incendiary missile with new countermeasures. It skated right through our perimeter. You . . . you . . . there's no good way to say this. You got medevacked right away, but they couldn't save you."

"You mean I'm dead?" McGrath wanted to scratch his head. "If I'm dead, what am I doing here?"

"This is a computer lab, Gunny. You're software. After you died, they—look, let's just say they programmed you into a machine. You don't want to know all they did."

"Maybe I do." He wished he could see something besides that damned wall. "Tell me."

There was a sigh, and it had an electronic buzz to it. "They kept you alive long enough to take some brain waves and do a magnetoscan, to get the electrical values and neural structures. After that they . . . removed your brain, and removed, extracted, some of the chemicals. RNA, proteins, other things. They decoded your memories and personality from all that, then programmed you into a computer."

"They can do that?" McGrath asked in surprise.

"Yeah. It's something MIT developed before the war. Anyway, the first four tries didn't work right—I don't know everything they did. They just flew me in from Pendleton this morning."

"I see. I should be upset, shouldn't I?" He wasn't sure. They turned my brain into a bloody milkshake, he thought, and I don't know if I should feel upset.

"I don't know what you should feel," Finn admitted. "This still pretty new. Your emotion-analog subroutines are integrating within nominal limits, but there are still temporary overrides on them to keep you from looping into a feedback cycle and degrading—"

"I love it when women talk dirty," McGrath said idly. "What have they got planned?"

"They're going to insert you into the German computer net," Finn told him. "You'll disrupt their entire system —erase data and software, foul up communications, spoof them with false messages—"

"Kid, I don't know anything about computers."

"That's why I'm here, Gunny," she said. "My orders are to train you."

How to train a computer program? With more programs. Cybernetic boot camp began with Finn teaching McGrath how to interface with new software. It was easy; he could do it by thinking a few simple orders. Magic words, he thought, although to the computers they were coded commands. Using software tools was as easy as firing a rifle. Aim and squeeze the trigger; evaluate the situation and activate the appropriate subroutine.

Once he had learned the basics, he was hooked into a computer network. McGrath found that there were all sorts of ways to block unauthorized access to a computer, and even more ways to defeat the blocks. As Finn explained it, there had to be a way to turn off the blocks, or the computers' owners wouldn't be able to use their own machines. McGrath learned how to find those ways.

Nobody told him why the military had decided to try this gimmick, but he could figure it out for himself. You needed something that was as smart as a human to make the right decisions in an operation like this. This was a combat situation, more or less, and McGrath had lots of combat experience. The poindexters could generate artificial personalities in their computers, but they still couldn't give their constructions anything to match human savvy. Copying was easier than creation. Equally important, if a spy or hacker copied McGrath's software, McGrath himself would prevent the thief from turning this particular weapon against the wrong people.

Besides, McGrath knew, in wartime everyone tried out goofy ideas in the hope of parlaying success into promotions.

As the training progressed, McGrath had visitors—or Finn did. His camera was angled so he could see the heads and shoulders of the people who walked into the lab. There were a lot of enlisted technicians, and some junior officers, and a sprinkling of civilian experts.

None of them talked with him, which he didn't mind. They all referred to him as "version five-point-one," and while McGrath no longer had any nerves for that to get on, it still made him uneasy. The "five" meant he was their fifth try at turning John McGrath into software, and the "point-one" meant they had modified that software. So, he wondered, how much had they changed him? Was he still Wacky Jack, or was the real McGrath up in heaven? Damn it, all he had left was his soul, but how could he know if it was the genuine article?

Questions like that were new to him, and scary. It was better to concentrate on his training, which kept him too preoccupied to worry about who and what he was. Besides, he didn't feel like a machine, which helped.

"It's just like sitting in an easy chair," he told Finn one day, when she asked him what it was like to live in a computer. "I sit here and hear things. The camera—well, it's like staring at a TV screen. Give me a six-pack and I'd be in hog heaven."

"What about when you execute on another computer?" she asked.

"I'm not sure. I have this feeling that I'm in it, kinda like the room has changed around me."

"You don't feel like you're moving, or seeing new sights?"

"Naw. There's no sense of motion or anything. I guess I'm not set up for much of anything," McGrath added.

"No, I suppose you're not." She sounded regretful. "I was hoping it was better for you than for me."

McGrath didn't ask what she meant. A few days ago someone had left a sheet of optical glass in his field of view. He'd seen something reflected on it, something the size and shape of a woman in a wheelchair. There had been something flesh-colored where a face and one arm ought to be, but there had been even more metal and plastic. "There's something I want to know," he said, to change the subject. "Why'd they pick me for this?"

"You mean instead of some poindexter?" Finn asked.

"Yeah. I'm learning the ropes all right, I guess, but some genius who knows computers could do the job better than me."

"Maybe not," Finn said. "I know they pulled this trick on other people and it didn't work. Scuttlebutt says they couldn't hack it. Some of them erased themselves. Others went catatonic."

"But why pick me?" McGrath asked. "I'm nothing special."

"No one in the squad would've said that, Gunny. You were always looking out for us. That's why the lab chose you. They say the others couldn't take it because they were too involved with themselves, but you're the kind of guy who thinks of other people ahead of himself. That gives you an emotional anchor." Finn sighed. "If this was peacetime we'd be studying you, but all anyone is interested in is sending you across the Rhine Line."

"Yeah?" That sounded more interesting than the headshrinker talk. It was something a man could understand. "What's the Rhine Line?"

There was a pause, and he knew Finn looked startled . . . or would if she had enough of her face left. "I guess you couldn't know," she said at last. "We got to the Rhine while you were . . . out. The Germans are dug in on the far side of the river, all the way from Switzerland to the North Sea. That's the Line."

"And we can't get through their defenses," McGrath concluded. The hovercraft landings on the French coast had caught the Germans off guard, but crossing the Rhine would be a different story. They'd watch every inch of it, and cover it with every weapon they had.

"We'll get through, Gunny," Finn said. "And then maybe this stupid war will end. Maybe . . ." It wasn't quitting time, but her chair whirred suddenly and she left.

McGrath had never learned what had happened to her, or to the rest of his squad. Finn wouldn't talk about it, and nobody else at Sandia was prepared to satisfy a computer's curiosity.

Well, he could do a thing or two on his own. Finn had left his modem hooked into the network. McGrath infiltrated the net, looked around and cracked his way through the first exit he found. He accessed some sort of mainframe computer. The mainframe had access to the outside world—okay, McGrath conceded, to the military computer nets outside Sandia.

He hesitated, then went looking for the Bureau of Personnel computer. BuPers had files on everyone in the Marine Corps, and it got real-time updates on all of them. It could tell him what everyone in his squad was doing right now. Data flowed.

McGrath hated what he found. In the past three

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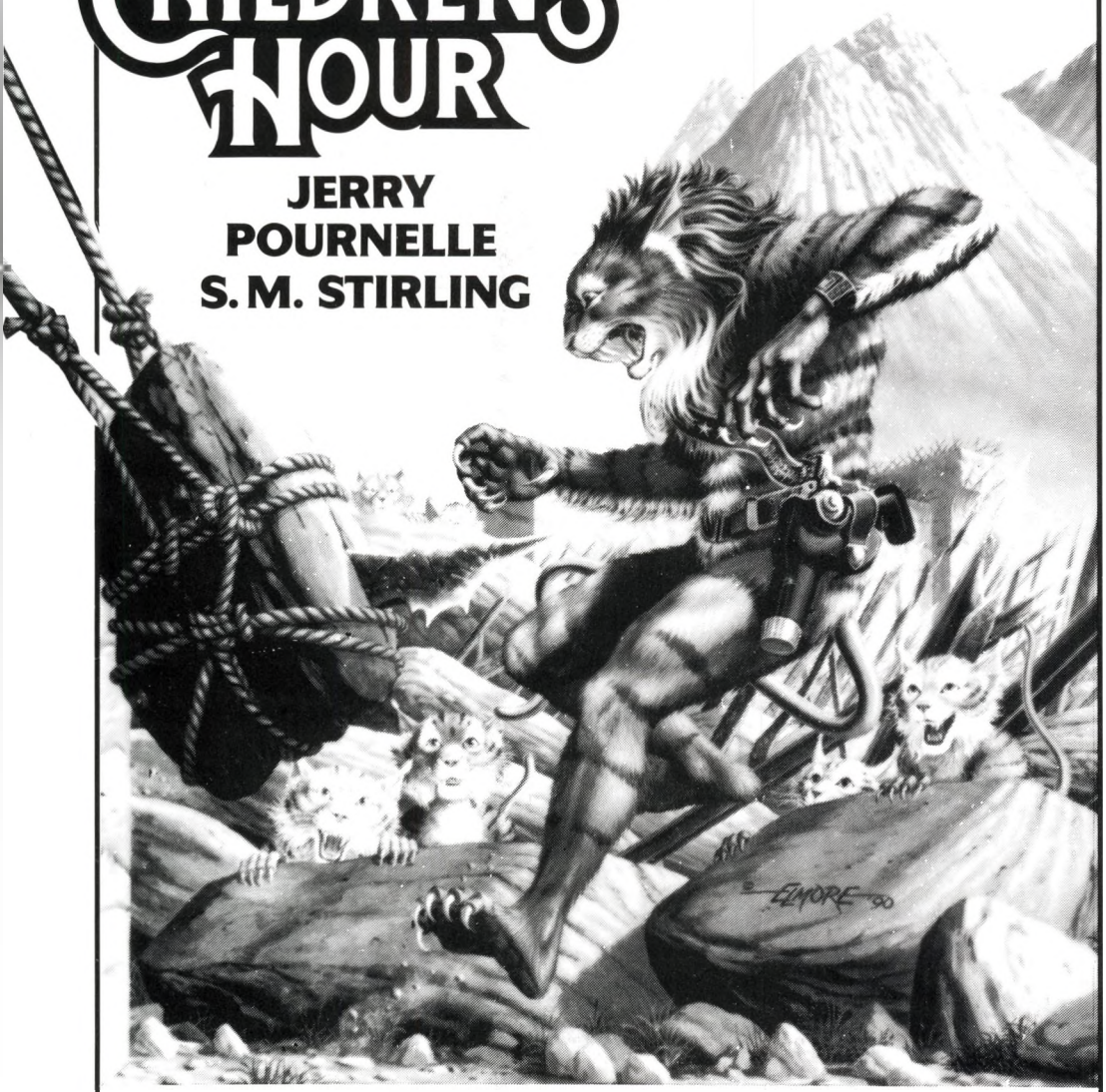

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months half his squad had become casualties. Cortez had died when one of her ground-skimming skate missiles blew up in her face. Damn it, he'd warned her about that. The sensors in Mechlin's boots had failed and he'd stepped on a mine. Nelson was in Bethesda, getting bionic eyes after a battlefield laser blinded him. A neuroscrambler had turned Shipler into an imbecile. McGrath shied away from reading Finn's file, figuring that the kid deserved some privacy.

Laine and a few others were still in action, but McGrath felt overwhelmed by the number of dead and wounded. Maybe he could have saved some of them if he'd been there. He felt like he had deserted his people.

That was the sort of concern the real McGrath would have, he told himself, so maybe he *was* still himself and not a copy. A sense of self-contempt followed that thought at once. The real McGrath wouldn't have worried about metaphysical bushwa; he would have looked for a way to help his people, and he would have found it.

There was a sudden feeling of—of *change*, transition. "What the hell?" he wondered.

A voice growled. "You were conducting unauthorized activity on a restricted system."

"I was?" Wacky Jack came to the fore. "Hey, I didn't see no 'Off Limits' signs."

"There were communication blocks which you penetrated," the voice said. McGrath accessed a voice ID file and attached a name to the growl: General Haviland. "Those are the same as 'Off Limits' signs."

"No fooling? Yeah, I shoulda guessed I was in officer country when I found that sex simulator. *Debbie Does Digits*. Ever try it? I ain't had a time like that since we stormed the red light district in Tripoli—"

A groan cut him off. "Does it always act like this?" Haviland asked.

"This must be why Corporal Finn calls it 'Wacky Jack,' sir," a new voice answered.

"Can't you fix the thing?" Haviland demanded.

"There's nothing to fix, sir. Autonomous goal-seeking programs are supposed to display curiosity and initiative. It's harmless."

"Harmless, huh?" Haviland sounded suspicious. "Kraut sympathizers are everywhere, mister. What if one of them programmed the thing to turn against us? Or what if something went wrong with it?"

"Impossible, sir," the second voice said. "Nobody understands the software well enough to subvert it. And the donor, a Sergeant McGrath, was noted for his high loyalty quotient. He couldn't turn against us. He was a little eccentric, sir, but harmlessly so, and—"

"I still don't like this monkey business," Haviland said. "Fix it so it's less . . . *eccentric*." Then there was that down-the-drain feeling as he was turned off.

Finn turned him on again. "Gunny?"

"Right here. What's up?"

"General Haviland just spent the past hour reaming me out. Security hauled him out of bed over what you did tonight."

"And he didn't like having his beauty sleep ruined." McGrath decided he had no use for anyone who'd give Finn a hard time. "Sorry if I got you into trouble, kid. I wasn't thinking."

"Trouble's nothing, Gunny. There isn't a whole lot anyone can do to me any more."

McGrath didn't want to think about what that implied. "It's a good thing for old Wacky Jack that you're here," he said. "I'm glad you volunteered for this detail, kid."

"I didn't volunteer. I've been on active duty all along."

"Huh?" He felt startled. "Look, kid—well, I figured—"

"That anyone as chewed up as me would get discharged?" she finished. "That's what I thought, too. Only there's a war on. After they patched me up they put me on limited duty, to release some other poindexter for the front. Letting me sit in a VA hospital would waste a valuable resource, they said. There aren't enough of us brains to go around any more."

"Yeah . . . I guess this type of war uses you up."

"It uses up everyone," she said. "Look, Gunny, don't worry about me. Hey, they told me that in a few years they'd probably know how to regenerate me. You know, when the war's over and they don't have to put everything into weapons any more."

"That sounds like a good deal," McGrath said, although he didn't think Finn believed it any more than he did.

They got on with the training, but what Finn had said stayed on McGrath's mind. War uses people up, he thought, and the world wasn't exactly swarming with genius-plus types. What would everyone do after they used up all the supergeniuses? Would they send the mere geniuses into battle, and when they were gone, the above-average? Would this go on until there was no one left who could handle a skate missile or a lightphone or a computer? And what would the country be like after it lost its best minds?

McGrath didn't know. He decided that becoming a computer hadn't made him any smarter. Maybe the only thing he could do was wait until they sent him into Germany, and then do whatever he could to shorten the war.

A lot of good that would do Finn, he thought. Maybe the brain who could have figured out how to regenerate her was already dead, or maybe the guy would buy it before the war ended. Or maybe somebody would decide that improving the next generation of weapons mattered more than fixing a busted-up vet like Finn, because you always had to get ready for the next war.

As usual Finn left McGrath's computer switched on at the end of the day, and after she went back to her quarters McGrath decided to go prowling again. He was careful this time. He'd done something to give himself away last night—yeah, there. He identified a sensor which detected activity in his modem, and a subroutine that monitored power consumption. McGrath gave them the shaft and went about his business.

McGrath found thousands of data channels, and Wacky Jack made the selection, going for the one with the toughest defenses. He reasoned that there had to be something interesting stashed there, and by God there

was: a Central Security Service event summary, a daily news service for top-level decision-makers.

The service downloaded data into him. The stalemate on the Rhine dragged on as a battle of attrition. The negotiations to get the Russians back into the war had stalled again. The growing expense of the war meant a peace of exhaustion would occur in another six months. The Germans had found a major chromium vein in Westphalia, and the probable effects on the postwar world economy made it imperative that the Alliance destroy the mines before peace was restored; priority should be given over the elimination of the obsolescent Ruhr factories, to ensure American control of postwar markets. Second priority went to the crippling of the German computer networks; replacing them after the war would boost the American cybernetic industry.

McGrath felt disgusted. He had fought because for the third time in a century the Germans had gone on the rampage, conquering territory and killing everyone who objected to being conquered, and threatening to do the same to the U.S. of A. McGrath was all for prosperity, but he hadn't watched his people fight and die for the Dow-Jones averages.

McGrath left the computer network and waited. No one came in to shut him down, and by the time Finn came back in the morning he decided his reconnaissance had gone unnoticed. He wondered how Haviland would feel if he knew McGrath was better than Sandia's own defenses.

Finn parked herself outside his field of view. "Good morning, Gunny."

"Hi, kid. What's the word?"

"You're shipping out soon, Gunny. They're downloading you into the enemy computernet."

"Jumping behind enemy lines," he said. "When do I go?"

"As soon as they can get a downlink to the German military system. Any minute now, I guess."

McGrath heard tension in Finn's voice. "What's wrong, kid?"

"Well—they don't download you into the other system. Just a copy of you. Maybe a lot of copies, I don't know. But you . . . once you're over there, they'll erase the software in here"—he heard a metallic click and knew she'd touched his computer—"erase *you,* and . . . and . . . I know it shouldn't make any difference, a duplicate of your software is still you, but—"

"Yeah." Dead, he thought. Oblivion. Where did erased software go? And Finn couldn't bring herself to use the D-word with him. "Don't feel bad. It's past my time. Sometimes I feel like I did when I was a kid, staying up past bedtime." He wasn't sure he meant that, but he felt he owed it to Finn. Wacky Jack always took care of his own, no matter what they needed.

"Thanks, Gunny," she said. "I'm going to miss hearing you call me 'kid.' You—"

There were footsteps as people entered the room. "Corporal Finn," General Haviland growled. "Is the software engaged?"

"Yes sir." Her voice was neutral, almost mechanical.

"How about the problems?"

"Sir," she said, "everything is fully functional. The autodebugging utilities and replication algorithms are—"

Haviland cut her off with a snort. "I don't need this technical jive. Push your buttons and make it work."

"You ordering me out, General?" McGrath asked.

Haviland looked at the camera. "Well . . . in a manner of speaking, yes."

McGrath decided that he enjoyed seeing the perplexed look on Haviland's face. "What exactly are my orders, sir?" McGrath asked. "Nobody's told me anything yet. I really think I should know what I'm supposed to do, sir."

Haviland frowned as he mulled that over. "Your duty is the ancient one of the infantry," he said at last. "You are to occupy enemy territory."

Smug SOB, McGrath thought as Haviland paused. "What sort of turf can I hold?"

"Computer space, Sergeant. You occupy a large amount of CPU and RAM space. You'll clog up the German network, making copies of yourself until the German computers are filled with McGrath 5.1 and unable to run any other programs. They'll be overrun by an army of McGraths."

"I get it," McGrath said. It seemed ingenious, if daunting. Even if the Germans could protect their software against his attacks, he could still cripple them by clogging their network with his presence. Of course, if he made endless copies of himself, how would he ever know which was the real McGrath?

Haviland forged ahead, blithely unaware of McGrath's qualms. "Sergeant, our backs are to the wall. The Germans are gathering strength for a counteroffensive, and we need everything we have to hold the line. Your actions and your courage over the next few days could be crucial in deciding the outcome of this war."

"Yes, sir," McGrath said, and wondered if the man didn't feel ridiculous giving a pep talk to a computer. Then Wacky Jack took over. "Sir, you can't see it, but I'm saluting in here."

Haviland saluted. A second later the others copied the gesture with somber faces, although McGrath heard a snicker from Finn. He hoped she would spread the story, which seemed a fitting cap to the Wacky Jack legend.

With awareness but no sensation, McGrath found himself in a new computer. The data flow told him it was the master coordinator of the Allied military network. He checked around, and learned that he had already been erased from the Sandia machine. Haviland had wasted no time in getting rid of him, although McGrath didn't feel bothered. The good Lord had only issued him one soul, and if he still had a soul he didn't want to share it with a bunch of electronic clones.

A satellite uplink opened, and the routing data told him this was the gateway to the German machines. The link could handle a rapid, massive data flow, and that let McGrath observe the German system, find its weak spots and infiltrate it. Within seconds he had obtained a foothold in the system. McGrath began to copy himself into the German system—and stopped. McGrath had his

orders, but Wacky Jack didn't like them. His priorities weren't the same as Haviland's. For a few seconds he thought about what he really wanted. Then he went to work.

He widened the linkage between the two hostile networks. Sensors and programs on both sides detected McGrath's actions; the sergeant overrode them, cancelled the error messages they generated, and sent more appropriate signals. Seated at their consoles, human operators on several continents and in the space stations read messages which told them all was well. What they don't know won't hurt them, McGrath thought.

Covering his tracks even as he made them, McGrath prepared and launched a massive, coordinated assault. The German system was an easy target. The Germans had sacrificed internal security for efficiency, and there was little to stop McGrath. The Allied defenses were tougher, but McGrath had practiced against them and knew their weaknesses. Within minutes the German and Allied war efforts were a mutual shambles. Artillery barrages and missile bombardments stopped; ships and infantry units froze in place; factories and supply lines shut down; coded orders were trashed.

The chaos could not go unnoticed forever, and the programmers soon began to counterattack. McGrath parried their efforts with ease as he deepened his control of the networks. He could operate at cybernetic speeds, and usually he could counter a programmer's moves before the guy could finish typing them into a keyboard. Screens and printers churned out false messages and gibberish. Computer after computer fell to his assaults. A few machines were unplugged from the nets, to no avail; they were useless in isolation.

As the seconds turned to minutes, and then to hours, McGrath grew more and more experienced at this new form of combat. He generated new programs to handle the routine situations while he gave his attention to the less orthodox among his opponents. He got their measure as they grappled, and he found no one who could beat him. McGrath had never thought of himself as a genius, no matter what the IQ tests said, but his existence as a computer gave him an enormous advantage over organic minds.

It was a distinct pleasure to have that advantage over General Haviland. As soon as the war effort went to pot Haviland tried to arrest everyone on the project, including Finn. McGrath held up those orders, and sent a few messages which led to Haviland's swift removal from Sandia and transfer to a communications outpost in upper Greenland.

That made for a pleasant diversion, but as McGrath watched panic and confusion spread through both military nets he felt a twinge of conscience. The Germans were the enemy, and they had to be defeated, but he'd just made it impossible for his side to win. Would he have done that before this transformation? he wondered suddenly. He had been a loyal man. . . .

McGrath told himself that he had just stopped the killing, and that if the war had kept going America would have lost too many of its best people. If the Germans really had to be defeated, then good old Yankee ingenuity ought to find a way to do the job without something as wasteful as war. Maybe so, he thought, but that didn't ease his doubts.

His cybernetic attention plucked a signal from the chaos: an emergency message from his old squad. "What should we do?" a familiar voice asked. Laine, McGrath thought. He sounded scared. "Come on, is anyone out there?"

McGrath handled the call directly, instead of letting one of his subprograms take it. McGrath identified himself as a battalion commander. "Just hang loose," he told Laine. "We're getting everything under control again."

"What's going on, sir? What are our orders?"

"Set up a defensive perimeter and wait for further orders," McGrath said.

"Do you want us to send out a patrol?" Laine asked.

"No, just hold your position. We don't expect any more trouble. Everything is all right." He wanted to tell the kid that the war was over and he wouldn't get shot at any more, but McGrath knew Laine would figure that out in a few days.

"Understood, sir. That's great. Thanks."

McGrath felt warmed by the relief in Laine's voice. Everything *was* all right, he thought. Wacky Jack always took care of his own. ✦

Line Item on a Dead Grant

Jack C. Haldeman II

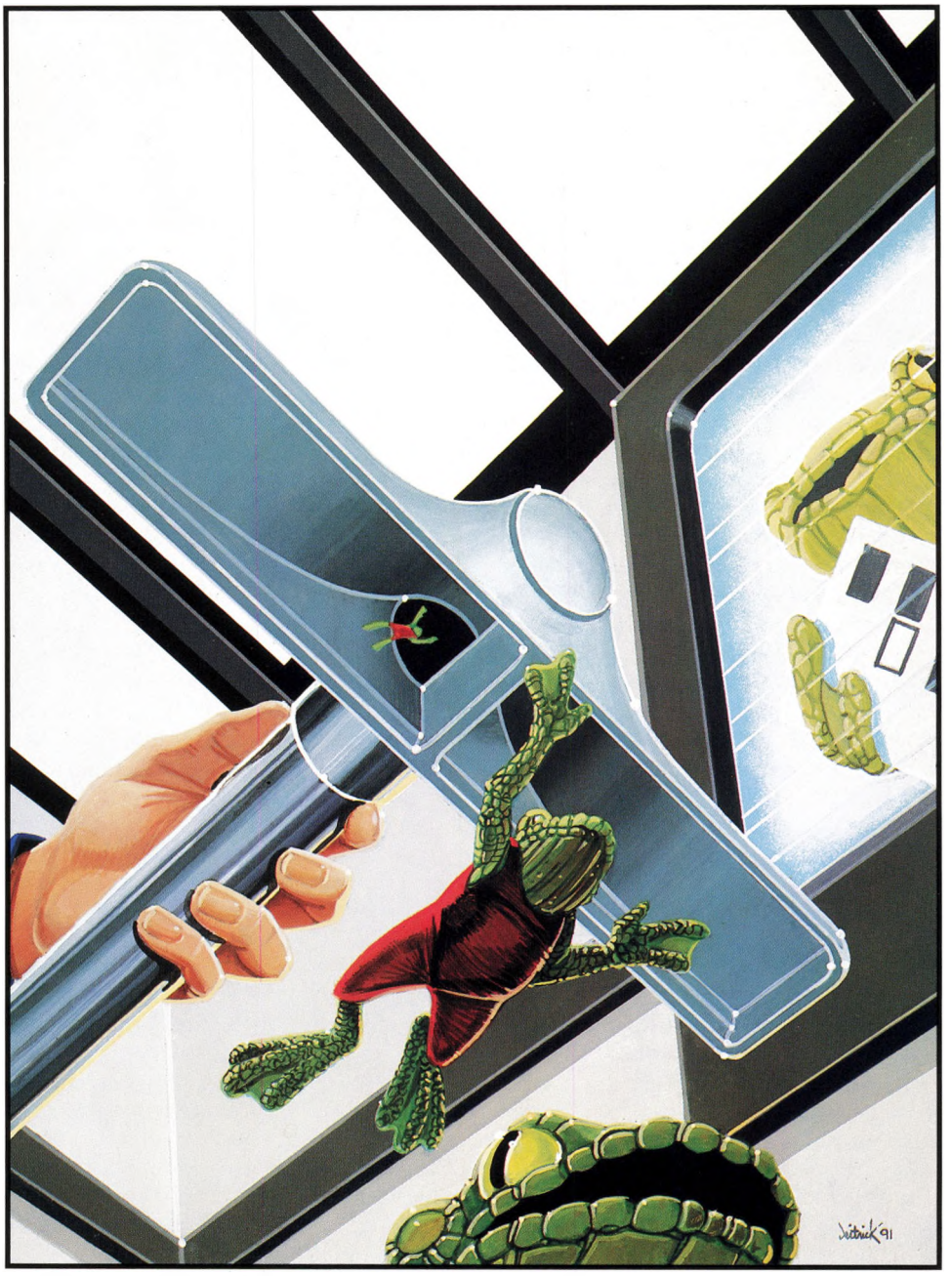

Illustration by David Deitrick

This be one crazy place to work. Stay in school, my mama told me. You'll be getting a better job. Well I saw it through till the tenth grade. Look at me now. I'm pushing a broom at the university. First one in my family to get to the university. Mama proud as can be. It sure a crazy place.

Quiet too, now the grant is gone. Everybody gone but me. A grant is something that sends you money. You buy stuff with it and it sends you your paycheck ever two week. It don't make sense, but that's the way it is. No grant, no

money. That's why they is all gone, even Stanley. Just me and my broom left to clean all three floors in the Annex. I miss Stanley.

Stanley was a good boy, but he was no line item and he had to go. Me, I'm a line item. That means I get paid by the university. Everyone else got paid by the grant. They be gone and I be here. I got twenty-seven sick days coming. Never missed a day yet.

Oh, it was a busy place when I first came here. Lots of people running around getting lots of those grant things. They spent money like it grew on some tree. And the things they bought! You wouldn't believe it. Boxes coming through the door all day long.

There be nothing they wouldn't spend money on. I needed a new mop one time and they went and bought me some fancy electric scrubber. Cost over four hundred dollars and had more chrome on it than my cousin Lester's Cadillac. Didn't work worth a damn, either. Made a lot of noise. I put it in a closet and borrowed a mop from Esther down at Ornamental Horticulture.

All those people were hot-shot scientists. You couldn't hardly talk to none of them without having a college degree or two. Don't get me wrong, they was pretty okay people, it's just that they most of the time sat in front of their calculator screens and when they talked they used a lot of big words.

Big words don't scare me, though. I been two months through the tenth grade. I ain't ignorant like some I know. Stanley would write down some of the big words for me on slips of paper and break them down into little words. I can handle the little words okay. Stanley was like that. He'd do things for me even though it wasn't his job. I kept all his slips of paper in the closet by the old scrubber. But, like I said, he wasn't no line item and he had to go.

It was bad when they got word the grant was gone. *Not renewed* was the way Stanley put it. I felt sorry for them because I knew their paychecks would stop and some of them were married with kids and all. Stanley just laughed at that and said that scientists could always get another job. Having to leave the project was what bothered them most, he said. It was fun work, I could see that, even if I couldn't understand what they were doing half the time.

Black Holes, wrote Stanley, *are enigmas shrouded in mystery.* You couldn't prove it by me. But it sure got them excited and they spent a lot of money looking for them. You'd have thought it was something important. They sure got serious when they talked shop. *Theory holds that when a star collapses the matter becomes so dense that not even light can escape. We are less interested in theory than a practical demonstration of the phenomenon.* Dense is right. At times they be some kind of dense. Even Stanley, truth be told.

So when the grant was going *down the tube,* they started spending even more money. Seems like you can't leave a grant *unencumbered.* That means you got to spend out all the money. It must be some rule they got. They ordered a bunch of stuff and then they left. No body here to sign for it but me, so I did. Lots of stuff. Whole bunch of boxes.

At first I was bored. They all left and it was just me. How many times can I clean the floors if there ain't nobody tracking 'em up? I must've washed the sink a thousand times and there be nobody using it but me. But my paycheck came ever two week so I never said nothing. I ain't no fool. Like I said, I'm the first in my family to make it to the university, and that's worth something.

So I got to unpacking the boxes just to get them out of the hall. They be full of those little white peanuts that go ever which way. That kept me busy for a while. Some stuff was packed with them plastic sheets with little bubbles in it. I like to pop the bubbles. I put the boxes in the dumpster out back. They empty the dumpster ever Monday if there be anything in it or not. Like I said, this be one crazy place.

After I cleaned up all the peanuts, I got bored again. I moved most of the stuff into the lab 'cause that's what they always done. Then I started at the top floor and mopped and waxed till I hit the basement. Took my time, I did. No use bustin' my butt if there ain't no one watching. I do my job, don't get me wrong. Just don't see no reason to hurry. Took me most of a week to finish. The floors looked real good.

After the stuff stopped coming things got quiet. I never saw no one from day to day. I punched in at eight and out at five. Half hour for lunch and two fifteen minute breaks. Ever two weeks I send in my time card and get a check. I know the rules and I do good even if there ain't no one watching me.

So I did the floors again and even cleaned out all the closets. Time sure went slow. Washed the windows. I dusted the lights and kept the a/c on so the calculator wouldn't burn up. Still, it did get kind of slow with no one around.

I started messing with the stuff they'd bought. I couldn't see how that would be much of a problem, since there weren't no one here to say don't. It wasn't so hard. The things with wires that went into the wall was easy. Just plugged them in like I do my radio at home. Some of the stuff had funny wires on 'em so I just moved things around until everthing was plugged into something else. A couple of things started smoking, so I unplugged them and put 'em in the dumpster.

One day I turned on the big calculator. That's an easy thing to do; I seen Stanley do it a hundred times. A big old tv screen at the end of the room got full of static. Seems to me that as much money as they spent around here they could have afforded a good pair of rabbit ears or even hooked up to the cable so I could get some of them movies or a soap opera.

Black holes, as we perceive them, may not be entirely natural events, wrote Stanley. *It may be that they are constructs of advanced civilizations and that their purposes are beyond our comprehension.* Sometimes Stanley wrote garbage. But he was a nice boy, even if he weren't no line item.

I watched the static for a couple of days. It was no better than watching grass grow. I did the floors again, starting at the basement for a change. Took two weeks doing it and I did a right proud job.

It was then I started messing. I seen them do it and there ain't nothing to it. It don't take no high school diploma to turn a dial and any fool can push a button. It would change the static on the tv screen. One time I got some sort of a test pattern like they have in the morning or at night after they play the Star Spangled Banner and the jet planes fly by. It was kinda nice and I left it there for almost a week before I got tired of it. I was hoping *General Hospital* would come on.

So I pushed some more buttons and turned the dials here and there. Some times not a thing would happen. Other times the screen would get all crazy. *Timeshare,* wrote Stanley. *We have one channel on a fifty-channel satellite, so we have to timeshare with MIT.* I don't know MIT from Lysol, but I know what share is all about. If I have to, I can wait my turn.

I wrote everthing down in the book just like they did. I seen them write stuff down when they go to change the buttons. The pencil was even still there by the book they did their writing in. But I didn't exactly know what they was writing down there so I just wrote my address in the little spaces in the book. I know my address real good; I can pen it out as well as anyone.

It wasn't long before I got a picture on the tv. I cain't be proud of it, though. My sister Fran gets a better picture on her tv and all she got is tinfoil hanging from the wires in back. It was a real fuzzy picture at first, so I messed with the dial to see if I could get it clear. I hate to say it, but Fran was right. When I hung a few strips of tinfoil in back of the calculator I got a better picture. I won't never tell her that, no way. Fran can get right uppity. She do know her tv, though.

The possibility exists, wrote Stanley, *that black holes could actually be communication devices, like our telephones. Or perhaps even matter transmitters.* Stanley was nice to me, but he was dumb. Ain't nothing here that looks like no phone 'cept the pay phone in the hall and it never ring.

My friend Esther she says I'm going to get in trouble messing around with all this stuff but I know better. Ain't no one ever come by here to see what I'm up to. Besides, Esther she work in Ornamental Horticulture which is plants, and this is *science.* What do she know about science?

Well, the picture on the tv screen wasn't much but it was a start. I hung some more tinfoil in back of the calculator and pushed a few buttons. It helped. Still wasn't no *General Hospital* or *Days of Our Lives,* though. Just a bunch of green frogs like on some gorilla nature show on channel 5. Better than nothing, though. Helped pass the time.

I got to where I liked the frogs after a while. It was almost like they was talking to me. Ever once in a while one would come up close and his whole head would fill the screen like he was looking around or something. Funny how they seemed real big one minute and real small the next. Television will do that to you now and again. It will fool you if you don't watch out.

Could never get the sound to work right, though. All I could get was chirps and some real high squeeking. I ain't never heard no frog sound like that. On the other hand, they never played no commercials, so that made up for the bad sound.

Once in a while a frog would stand in the middle of the screen holding a sign. He'd stand for the longest time not doing nothing else. Couldn't read the sign, though. It wasn't written in no English I ever saw. I figured I must be getting some kind of foreign station. On the set at home I can get Chicago some nights, so I know it can happen. Maybe it was Cuba.

Early on I figured out it was a cartoon show with frogs. That explained why they did silly things like wearing clothes and showing me machines and stuff. My nephew Josh likes cartoon shows. I thought about bringing him in to watch, but I didn't want to tell anybody about the frogs. I might get into trouble. I didn't even tell Esther.

So I went about my business keeping the place clean while the frogs jumped around on the tv screen. It was nice having company even if the company was tv frogs. One of them wore a red hat and it seemed to me he'd wave back if I waved at him. He was a cute little frog and I was sorry when they quit being on the tv.

They was building some sort of a machine. Took them a long time. One day they went inside of it and then I didn't see no more frogs. I waited most of a week and when they didn't come back I changed the station.

I guess the calculator must be broke, cause I can't get no more good pictures. I could worry about that, but I got bigger problems. Bugs.

I hate bugs and this place is crawling with them. They about the size of fleas and they is everwhere. We never had no bugs before. Oh sure, maybe a roach ever now and then, but nothing like this. They be green and I think they may be like those little bugs I get on my roses. I can't see them too good without my reading specs, which I lost at the picnic last year. Yesterday I saw about a hundred of them jump up and down on a button until it pushed.

I is got to do something. When I try to sweep them out they just run and hide. They is little suckers and can get most anywhere. There be a whole bunch in the wiring inside the calculator. If I look through the fan holes I can see them in there moving stuff around. Stanley wouldn't have liked that one bit.

Esther she says they got a bug spray at Ornamental Horticulture that will kill most anything. I may have to give that a try for it is getting out of hand. I be going crazy chasing the bugs. Yesterday I thought I saw one of them wearing a little red hat, so I know it is getting to me.

I'll go see Esther Monday morning. But now I got to punch out. It be five o'clock and time to leave this crazy place. ✦

Time Enough

Illustration by Debbie Hughes

Vivian Vande Velde

Monday morning, the day of my first on-line assignment, I was late.

I hoped anybody important would assume I was returning from an early orientation meeting. AT&T, Time Management Division, is a big place and people are hard pressed to keep track of themselves, much less each other. After all, it had only been a month since I'd been bumped out of Payroll and Accounting and landed here.

Then again, if I was real lucky, anybody important wouldn't recognize me anyway.

Zorana was sitting at her terminal in the reception area,

staring at a blank screen, biting her fingernails. "Hi, Zorana," I said.

"Oh," she said. "Hello. Larisa." Each word was slow and deliberate and had at least one extra syllable. She smiled with that eager chipperness that means she's trying hard to remember something. She straightened the ASK ME IN ANOTHER TWO HUNDRED YEARS sign on her desk, a standard joke in Time Management Division. Suddenly it came to her. "Tyler's been looking for you. He said for you to go to . . . Conference Room . . ." She bit her lip, then smiled chipperly again.

When I found Tyler (on the second try, Conference Room Orange), he performed a smile: more intelligence to it than Zorana's, but none of the sincerity. This was bad news: that a class-4 Supervisor could be kept waiting by a line operator and still feel it expedient to smile.

There was one other person in the room, a stranger. He had sandy-colored hair and a much nicer smile than Tyler or Zorana. He wore an oversized shirt, buttonless and open to the waist, circa 2460, which was weird because—crazy as fashion gets—nobody's crazy enough to do 2460. But he looked good in it, and he extended his hand and started to say, "Hel—"

"Larisa Speranza," Tyler interrupted, "this is Kelly. He's Dr. Goldblaum's replacement."

"Hel—" he started again, but this time I interrupted. "Replacement? Doctor Goldblaum's? What . . . ?" My surprise was making me sound like Zorana. I had assumed old Goldblaum had been around long enough to be out of danger of getting bumped.

Kelly took a breath to explain, but Tyler stepped in again. "Temporary. A mild case of cancer. He's staying home till he's over it."

I had last seen Goldblaum on Thursday, the day before our final medical checkups. That must have been when they spotted it. Half relieved and half chagrined, I said, "So, the trip's postponed?"

Kelly opened his mouth again and Tyler said, "Not necessary. You and Kelly will go."

What Tyler really meant was "Not cost-effective." I knew as well as he did that line operators were on a tight schedule. Postponing one trip would mean delaying the training period for the next one, leaving a lot of other personnel with nothing to do in the meantime. And the stockholders would never stand for that. Still . . .

"But you can't just send in a last-minute replacement," I said. "Dr. Goldblaum and I have prepared together—"

"Kelly knows everything Goldblaum does."

I shook my head. Whoever this Kelly was, he wasn't a line operator, so how could he know . . . ? I glanced at him again, and he gave an apologetic smile. Nice smile. Nice green eyes. He was very good-looking.

Too good-looking.

"Oh, shit," I said. He was, as they say, too good to be real. A gennie: a genetically engineered clone, with a lab-grown body and a programmed personality. They had fitted Goldblaum's brain engrams into a preexisting construct, and they must have done it over the weekend, which meant they were going for speed rather than stability. Rush jobs don't hold up very well; they result in erratic idiosyncrasies and personality meltdowns, what the non-techs call the warm-jello syndrome.

In the awkward silence, he finally got the chance to give that wonderful smile again and say, "Hello. Glad to meet you, Ms. Speranza." Warm, but very formal, very old-fashioned. Very Goldblaum.

Tyler dumped a sheaf of papers into my arms—Olin's field report. Field reports, and the annual report, are the only times they generate hard copies. As though hard copies could help anybody keep time lines straight. Tyler said, "Since you were late, you won't have time to read it all." Which goes to show how important a field report is in the first place. But it was procedure, and it was occasionally useful, although I didn't think this would be one of those occasions. Goldblaum and I had gone through a fair amount of preparation for this assignment—it was my first one, after all.

Anyway, I wouldn't have had time to read the whole report if I had started Wednesday morning. Which would have been impossible, considering Olin and his team hadn't left until noon Thursday and had come back twenty-four hours later. Everybody's gone twenty-four hours; that's how the equipment works. It spirals the team down to the targeted year, then exactly one day later—both real and subjective time—it yanks them back. The techs compare it to that kiddie toy with the ball fastened to the paddle by an elastic string. Then the techs say: Except the aim's better. Then they say: Usually. (Ha, ha. More Time Management humor.)

So Olin and his team had been away for one day, back for three, and had generated enough verbiage to paper half the johns in the AT&T complex. "Thank you," I told Tyler.

"Ms. Speranza can read it during the trip," Kelly said.

Tyler gave him a dirty look, because the trip is about half a second short of instantaneous, which Kelly would automatically have known because Goldblaum knew it. Even I knew it, and I'd only been in Operating Staff a month.

Kelly gave him this look, all openness and big eyes, the picture of innocence, which is Goldblaum exactly, except that with that young face and those pretty green eyes he was even better at it.

Tyler must have decided to take it out on Goldblaum, because he only said, "You can brief her while Wardrobe sets her up."

"Yes, Mr. Tyler." Goldblaum is the only person I know who still uses *Mr.* and *Ms.* It's part of his old-fashioned charm. It sounded weird from Kelly, who looked to be in his early twenties; weirder still when you realized, body and programming together, he was only a few hours old.

Tyler scrunched his face, like he had a built-in sarcasm detector and was testing the air for traces of irony. He swept out of the door ahead of me, and I tossed the report down a disposal unit.

"They succeed?" I asked Kelly.

"Nothing succeeds like success," Kelly murmured. Goldblaum was always saying things that didn't make

any sense. Then Kelly shrugged, with an expression that indicated he hadn't read the report either.

Tyler, walking ahead, assumed the question had been directed to him. "Doctor Olin hired some of the locals to kidnap Silver, with instructions to hold her for a week." Okay, I thought. that means she won't be able to become the mother of Dictator-Appointed-By-God Angel Saroya after all.

Tyler continued, rambling a bit. "Last time out, the field team assassinated Saroya, but when Operating Staff went on-line, they found that Saroya's supporters had made a martyr out of him. They had rallied against the People's Republic of Quebec, making things even worse than he himself had."

"Yes, sir, I—"

"So this time we sent Olin's team to 2427, exactly nine months before Saroya's birth, and arranged to have his prospective mother kept away from his prospective father during the . . . uh . . . prospective time."

Kelly winked at me.

Just then, Tyler pulled up at the door to Wardrobe. "Here we are," he said. "Kelly can fill you in on the details while you get ready." He didn't seem to notice, or didn't care, that I wasn't lugging the report around any longer. Then he continued down the hall to his office, where his people knew how to suck up to the supes properly.

Kelly was already set. The Wardrobe people fussed, getting my straight, overfine brown hair into the elaborate, gold-dust-sprinkled ringlets the women of 2460 have always favored. The worst part was tattooing my earlobes. But I was ready in plenty of time. Each of us got a harness that housed a minor arsenal. Not only a necessity, but part of the costume: well-dressed sophisticates of 2460.

In the control room, the techs positioned us and made last-minute adjustments. When I was finally standing in the center of the power ring, I took the opportunity to wipe my hands on my silk pants.

Calm down, I told myself. Field teaming is the hard part. As line operators, all we had to do was see what results Dr. Olin's work had caused. The equipment would set us down in an out-of-the-way corner in the basement of St. Darrel's Cathedral. We would go outside, chat it up with the locals, read the papers, check out the vids, try to get a feel for the time line. Tomorrow, at—I checked the wall clock—12:07, give or take a few seconds, the equipment would pull us back home. The equipment brings the team back no matter what. If they need one more minute to finish their assignment, if they've been injured, or separated from each other, no matter where they are, who they're with: *zap!* It has brought back dead bodies—twice, that they've told us about.

"It's not bad," Kelly told me.

I knew. Goldblaum had said I wouldn't feel a thing. Kelly would have known that—how it felt as well as what Goldblaum had already told me. He was just trying to put me at ease.

"So," I said, "Kelly: Is that a first name or a last?"

"Whichever."

That sent shivers up my spine. After we got back, his brain would be wiped and the body would go into storage until it was needed again. Unless Goldblaum died in the interim and his family decided to buy Kelly as the next closest thing. Which they wouldn't. Clone contracts are expensive, and Kelly was only a rush job. It wasn't like he was a real person, I thought, but the lab people could at least have given him a whole name. . . .

"Kelly—"

"Don't move!" one of the techs growled.

"Ms. Speranza—" Kelly started.

"Call me Larisa."

"Larisa, there's something I think I should tell you."

My ears were beginning to buzz.

"I know Dr. Goldblaum told you it wouldn't hurt . . ."

I closed my eyes against the brightness of the light, which was suddenly bleeding the color out of the surrounding control panels.

The last thing I was aware of was Kelly saying, "He lied."

The nearest I can come to describing the sensation of time travel is to say it's like a sock: My mouth tasted as though I'd been chewing on one, and the rest of me felt like somebody had been trying to turn me inside out.

Kelly had hold of my arm, or I would have fallen. "Ms. Speranza." He shook me. "Ms. Speranza. Larisa."

My vision cleared. No wonder the floor felt tipped: It *was* tipped. We were perched on top of a pile of rubble.

"Larisa!"

Part of the floor settled under my feet. Kelly grabbed my other arm as I grabbed for him so that we stood nose-to-nose holding onto each other. We were on the ruins of a demolished building, quickly being surrounded by people who were dressed in clothes absolutely nothing like those Wardrobe had provided us.

"Hey!" someone shouted.

Kelly and I scrambled down from the pile of stone and concrete. It was the only downed building in sight, not like the first time when the field team had found the whole city leveled, populated by feral scavengers who glowed in the dark. These people didn't glow, but they sure didn't look friendly.

Kelly and I turned and ran.

Somebody yelled, "Stop them!"

We zigzagged around the debris, heading toward the back of the lot. Pursuers followed, or made to circle the block to cut us off. Others picked up rocks and began flinging them at us.

We hit the back street at a run. Not as busy, but still there were people. They stopped to gawk. Of course they did. Here were Kelly and I dressed in silk pants and boots, our shirts open to the waist, and the locals looked straight out of one of Goldblaum's medieval epics. The men had knee-length, brightly colored tunics and fuzzy leg warmers, and the women . . . At first I had thought there were no women, but then realized they were the ones dressed in white, their figures undiscernible under yards of shapeless cloth which went from

neck to ground, their hair and faces covered by white gauze. It had been mostly the white-clothed ones who had thrown the rocks.

We ran across the street and eased between two buildings, then slowed to a jogging pace to cross an empty hovercar lot. We crossed another street, slowed even more.

Kelly started to turn right, and I dragged on his arm. "The river," I panted, remembering that in some time lines there's a park there.

We scrambled over a fence. Not a park, exactly, but there were trees and no people. And the remains of another building, albeit smaller than St. Darrel's. This one had been burned out. INTERDENOMINATIONAL CHAPEL BY THE RIVER, a sign read.

Kelly looked at me with raised eyebrows, and I shrugged.

From beside me came the rattle of shifting rock and timber.

I only had time to think that we couldn't have been followed, not that closely, when Kelly dragged me into a crouch behind the sign. I peeked over the edge toward where we had been standing. A man was crawling out of the rubble. He looked left, then right, then left, then he moved forward a bit, then he looked all around again. Searching . . . for help? No. It hit me all at once. For witnesses. He didn't want anybody to see him. Just the kind of person who might be able to supply us with answers.

Next to me, Kelly shifted, taking his max from its harness. Not the deadliest nor most efficient weapon we carried, but the biggest, the most impressive-looking. He waited until the local was clear of the fallen rubble but still on hands and knees, then stepped forward.

The man was making one last check to his left when Kelly put the gun under his right ear. The man froze. I moved into his field of vision, holding a scrambler in both hands. "Don't even think of moving."

Kelly looked at me in exasperation.

"Well," I said, "I mean, move out of there, but slowly. Don't try anything."

He was young, maybe seventeen or eighteen, and skinny—I mean real skinny. He had a nasty red scar on his forehead, in the exact shape of a cross. He wouldn't take his eyes off me, off my shirt. And I had already pulled it as close as I could. Without the weapons harness to hold it on, I probably would have lost it three blocks back. He crawled out, finally spared a glance for Kelly.

"Anybody else in there?" Kelly asked.

The boy shook his head.

Kelly stooped for a closer look.

There was a tunnel: I could see that from where I stood. As Kelly moved to enter, I placed the scrambler against the boy's head. "Anything happens to him, and your brains are deep fried," I said. Actually, the scrambler's effects are only temporary. Kelly grinned behind the boy's back. This is not the sort of thing a background in Payroll and Accounting prepares you for.

In any case, Kelly was gone less than a minute. He motioned for the local to join him, then backed down the tunnel, still holding the max, with me following, still holding my scrambler.

The tunnel widened almost immediately. We went through a black curtain hung on some pegs, then a second one, and in another instant we were in a large room. The place seemed to be some kind of control center. All sorts of tech-looking stuff. Most of it had the look of having really been around.

"Not your typical interdenominational chapel," Kelly observed.

The young local glared at us.

"Any idea what it's for?" I asked.

Kelly shook his head. "I can recognize some of the individual pieces, but I don't see how they fit together: particle enhancer maybe . . . this seems to be something to do with radio communications . . ." He stopped at one machine that was marked with the yellow and black triangles used since the twentieth century to signify radiation and shook his head again. This wasn't stuff we had seen in 2460 before. He looked at the local. "What is this?"

The boy looked at him as though he couldn't believe the question. "Who the hell are you?" he countered. Which may have meant that anyone from 2460 would have recognized the machinery, or it may have meant something else entirely.

"Change of clothes." I had spotted a closet, in which were hung several tunics and one of the women's white outfits.

Kelly glanced over, and the skinny little youth's foot lashed out at him, knocking the max out of his hand. He slammed Kelly into one of the counters. Suddenly he had some sort of gun of his own in hand, which just goes to show that not everybody wears his weapons ostentatiously displayed like the 2460'ers from previous time lines. He had his arm at Kelly's neck and the gun at his head and he said to me: Think that little shooter of yours is faster than mine? *Put it down.* Put 'em all down."

I let the harness drop, and he stepped back from Kelly, motioning for him to unfasten his too.

That done, the boy pushed him toward the machine that had the radiation warning sign. "Turn it on and stand over there."

"There's radiation in that thing," Kelly protested.

"Shut up!" The local glared at him through narrowed eyes. "I need to find out if you're mechanicals."

"Mechanicals?" Kelly repeated. "*Androids?* You can't tell if we're people or androids without a radiation machine?"

"I can tell by shooting your damn head off!" the boy screamed at him.

Kelly stepped where he had been told.

From where he was standing, the local must have been able to see whatever it was he needed. For a moment he stood there biting at his left thumbnail—never letting the gun in his right hand waver—then he motioned for me to take Kelly's place.

The machine hummed softly, but I felt nothing. Besides scared.

Finally satisfied, he turned it off. "Who are you?" Back on that again.

"Kelly," Kelly said. "And Larisa."

"Shit!" the local said. "You're about to push me too far. You're not mechanicals, because the machine shows you're flesh and bone. You don't dress like the Mikes and you're sure as hell too well fed to be Lists."

Fat? He was calling us fat? Little else that he said made any sense. "We're . . . not from . . . here, exactly," I said.

"Yeah," he said. "West of the Mississippi, south of the Erie."

"Ohio?" Kelly asked me. Geography has never been Goldblaum's forte.

"Nothing," the local said. "Nothing but a big, frigging empty hole."

Kelly and I exchanged a glance. War? That was supposed to have been avoided by eliminating Dictator-Appointed-By-God Angel Saroya. Some other war, then? Or a nuclear accident? Or some sort of plague that Saroya's presence, in the previous time line, had prevented? The more Operating Staff fiddled, the more complicated things got. The paradoxes and intricacies were beginning to make my head ache.

"I think," Kelly said, because we had about twenty-three hours before we zapped back to home-time, "we don't talk to anybody but the person in charge."

"I think," the local said, "you do what I tell you, or I blow your damn head off."

"Yeah." Kelly grinned. "So you said."

He was assuming the youth wasn't totally insane, which I didn't think was a safe assumption, but the local refrained from blowing either of our heads off. He had me tie Kelly, arms behind the back, ankles together; then he checked the knots and tied me. We sat on the floor, which was cold and hard, and he examined our weapons, glancing up at us periodically to glare.

"Nice job you did back there," I whispered to Kelly.

"What?"

"Letting a skinny little adolescent overpower you. Whatever happened to superior breeding? And I thought you had done this before."

"Goldblaum has, but . . ."

"Yeah? So?"

"Come on, Larisa, he's sixty-five years old. Mostly, he sits back and lets his assistants do all the running around. I'm no more used to this than you are."

"Shut up," the local snarled.

I put my head down on my knees.

The clock on the wall advanced four hours, minute by minute, while the young local put together what looked to me like miniature explosive devices. It was late afternoon when we heard a raspy five-note whistle from the tunnel.

The boy picked up the gun from the counter and stood. Whistling five different notes, he moved to the radiation machine.

From closer in the tunnel, three notes.

The boy flipped the switch and moved to the same spot he had made Kelly and me stand. By the time the second curtain was pushed aside by a white-draped arm, the boy had his hand-weapon aimed.

The newcomer held both hands above her head. It was a woman, if I was right about the white garments, but between the gown and the headgear, her hands were the only flesh that showed. She stopped, with a glance in our direction, possibly startled, then moved toward the radiation machine.

The boy had stepped away and she took his place. From where I sat, I could see only the upper right-hand corner of a screen that had lit up when he had turned on the power. Because she had her hands raised, I could see the image of one of them on the screen—only the bones showed.

Scanner, I mouthed to Kelly, whose angle would have prevented him from seeing. It was some sort of primitive scanner. They were serious about this android business, then; were declaring themselves human. There's no mistaking our androids for anything but: They hum and click and buzz, they move like someone with a severe personality disorder, and they have very stylized plate-metal faces. It was hard to believe 2460 had developed anything better.

The woman pulled off the scarves that enveloped her head. She was about our age—my age—and she had a scar identical with the boy's: a cross, right between the eyes, as well as a mark on her cheek. A tattoo, which I couldn't make out.

"The Lord is our shepherd, Gabrielle," the youth said.

The woman bobbed her head. "We shall not want. We missed you. Nicholas was worried. Who are these?"

"Kelly," the boy said, "and Larisa. From beyond the Missis-friggin'-sippi."

Kelly grinned—God, is Goldblaum that cool?—and bowed his head as though at a formal introduction.

The woman looked disapproving, whether of us or of her companion's language I couldn't tell.

"They had these." He showed her our weapons.

She glanced at them, then came and stood before us. The tattoo on her cheek resolved itself into the shape of a fish—a line figure, stylized, or like a child's drawing. She took hold of my chin and turned my face this way and that. She was studying the tattoos Wardrobe had done on my earlobes: delicate rose blossoms, in three shades. Her fish was green. She looked down at the shirt that barely covered my chest, pursed her lips, moved to Kelly. She checked his ears, as though a man would get his lobes done, and ran a finger across his clear brow. This Gabrielle was no dummy, and she moved and spoke like someone with authority. Someone to be reckoned with. "Are you from another planet?" she asked.

Kelly smiled at her.

"Or . . . from a different time?"

I smiled at her.

"Your weapons are not like ours, your faces are not like ours, and your clothing is most certainly not like ours."

We both smiled at her.

How simple could things be? We only had to make it through another nineteen hours.

She stepped back to the counter where the youth had placed our weapons and picked up one of the maxes. "These weapons . . . these weapons are not of the technology God has granted us. Even the Mikes have nothing like these." She held it with both hands and stood in front of Kelly, aiming at mid-chest. "Like this?"

I swallowed hard. "Close enough," I said.

"You're from the future, aren't you?"

"Yes," I said, willing to admit anything.

"Here to do what?"

"Study. Help."

"Help." She snorted, but lowered the max. "How?"

"I don't know. I'm not sure." I sure as hell wasn't going to tell her about Operating Staff and how they had screwed up. "Our records of this time are scattered, confused."

She looked down at my chest again. "Obviously." As though reaching a decision, she put the max back on the counter and pulled out a much smaller weapon that had been hidden in the folds of her white gown. "Turn." She must have read apprehension in my expression. "Laser cutter," she explained. She sliced through the plastic strips that bound me, then did Kelly's while I tried to shake feeling back into my limbs. "Peter." She nodded her head to the closet, and the boy fetched the white outfit, which he dropped at my feet. He didn't look pleased about the woman's decision. "You must cover," she said. "A decent woman does not show her body."

I pulled the robes on over my other clothes. Corporate Auditing would throw a fit if we left anything behind.

The material was coarse and heavy. I started to overheat immediately. There was a patched spot right under my breastbone. Beneath and surrounding the mending was a dark smudge of discoloration. The material was full enough that it didn't show, but I suddenly realized what it signified: Somebody who had worn this thing before had died in it.

"That hair . . ." Gabrielle ran her fingers through the ringlets Wardrobe had created, then gathered it up at the nape of my neck and pulled out her laser again.

"Hey!" I said.

"A decent woman has no vanity." The beam sizzled, and she let the clump of hair drop to the floor. She wrinkled her nose against the stench but spoke tonelessly: "The veil would not have covered it all."

The only thing that kept me from throttling her was the suspicion that she was acting from fear.

"You will not need the sign, because a decent woman covers her face lest she unduly tempt a man. But your companion must have it."

The youth, Peter, dropped a purple tunic at Kelly's feet. (Much finer material, by the way, than the women's garb.)

"What sign?" Kelly asked.

Peter and the woman simultaneously put their hands to their foreheads. "The sign of God," she said, with a reverential inclination of her head. "To show that we love Jesus."

"No," Kelly said. "No sign."

"You must. The lack of it labels you immediately as being not of this world."

"No," he repeated.

"It would be the death of him," I said, which it would, because nobody in our time would want him if he wasn't perfect, and a touchy repair such as having a scar removed from his forehead was not as economically feasible as simply growing a new body. It was one thing to know Kelly was eventually going to have his mind wiped, quite another to know that he would be destroyed. But, considering these people's paranoid attitude toward androids, I didn't think I'd better explain about his being a gennie.

Peter and Gabrielle looked skeptical. Gabrielle stared at the laser in her hand, possibly wondering if she had time to do it before we could stop her.

I said, "We love Jesus, too. But this marking is not done in our time."

She sighed and put the laser away. To Peter she said, "Stay here with him until nightfall. The lack won't be so noticeable in the dark. Meet us at Nicholas's house." She started wrapping the veils around my face and head. "If you even suspect you're being noticed, kill him and run."

"Damn right," Peter snarled.

Behind Gabrielle's back, Kelly blew a kiss to me.

Peter scowled.

"You," the woman said. "Come with me."

Outside, a man in an orange and green tunic stepped from behind a pile of rocks.

I gasped, and Gabrielle whirled, laser cutter in hand.

The man raised his hands, grinning, and Gabrielle put the weapon away. Sounding disgusted at him for surprising her, she said, "This is Nicholas." Then, regaining her composure and turning her disdain back on me, she added, "Did you think we would be walking alone? Decent women don't walk alone where they can tempt men unduly."

Decent women could kick unduly tempted men in the balls as far as I was concerned, but she didn't give me the chance to say so.

"Nicholas, this is . . . Larsa?"

"Larisa," I corrected her. I extended my hand, but the man was obviously unfamiliar with the custom. I let it drop and started to ask, "What—"

"There is an appointed time for everything, and a time for everything under the heavens," they interrupted in unison.

Okay, I thought . . .

Neither Nicholas nor Gabrielle said anything to me or to each other as we walked. The streets weren't crowded, and most of the traffic was on foot—only a few hovercars. When other men passed, they would greet each other with phrases like "Jesus lives" and "Our Lord saves." Frequently the second man would give "Hallelujah!" as his answer, but there was no joy in this place. No music, no laughing, no flashing lights, very drab except for the men's peacock costumes. Nicholas nodded

to men whom we passed. Trying to be polite, I nodded once, and Gabrielle stuck her elbow into my ribs.

Right. Decent women don't nod.

By the time we got to the house, I was ready to bite someone out of frustration. Gabrielle removed her headdress as soon as we crossed the threshold, so I unwrapped myself too. "No pictures, huh?" I said, surveying the empty walls. Hardly any furniture either, but to make note of that seemed too blatant an impoliteness. I may have been irritable, but I didn't want to antagonize these people into doing violence against my person.

"She comes from the future," Gabrielle explained, picking up the veils I had dropped next to her neatly folded ones.

Nicholas stuck his face into mine. "Thou shalt not create any graven images."

"Right," I said. "Sorry." Only another . . . what? Eighteen and a half hours?

Gabrielle led me into the kitchen, where she put a pot on the fireplace and took a small package out of the cupboard.

"It's Sabbath," she explained, seeing my expression as she lit a candle. "No one to work the electrical plant."

"But the room we were in . . ."

"Oh, the Mikes store up reserves for their leaders. We tap into them where we can. The chapel is where we do our experiments and where we keep captured equipment." She unwrapped the package, revealing a small, greasy sausage. "How hungry are you?" she asked, knife in hand.

I thought of how thin Peter had been, and I certainly outweighed Nicholas, too, even though he was a head taller than I was. "Oh . . ." I said, and the appearance of the sausage helped my altruism. "That's all right. I'll just have a cup of coffee."

"Coffee?" she repeated.

"Isn't that what you're heating on the fire?"

"I'm heating water."

"Well, then, I guess I'll just have water. Not heated, though, please."

"It has to be heated. Causes sickness otherwise. Even the Council couldn't get clean water."

I nodded and prayed that Kelly would get here soon. "Council are the people in charge?"

"Were," she corrected me. "Until the matter of the farmers . . ."

"Yes?"

"The farmers wouldn't cooperate. They refused to honor Sabbath and the Holy Days."

"Sabbath?" I said. "Holy Days?"

"Sabbath: Sunday. Holy Days: Feast of the Blessed Spirit, Christ the King Day, Holy Redeemer Wednesday every month . . . Don't you know *anything* in the future?"

"The farmers refused to stop working on those days?"

She nodded. "They claimed they couldn't get everything done with all the Holy Days, tried to stint God . . ." She paused to bow her head. ". . . so the Council had to execute them."

My throat tightened at the thought. "They killed all the farmers?"

"No, of course not *all*. But the crops *have* suffered."

It didn't make a whole lot of sense. "So you and your friends overthrew the Council? For killing the farmers? And now they're after you?"

"Of course not. The Council was made up of Lists. They did the best they could. It's the Mikes who are dangerous."

"Mikes? Lists? I don't understand."

"Avenging Arm of *Mich*ael," she explained. "Fundamenta*lists*. You do not know these things in the future?"

"Ah. Religious wars."

"Yes. The Mikes are fanatics." (*Fanatics?* The Mikes? When it was the Lists' Council who did away with the farmers? Most likely decent women don't snort at their hosts, I warned myself.) "They said God was angry with the Council, otherwise He would have made the crops bigger and better the way He did during the time of Noah, when men lived to be hundreds of years old. The Mikes said the Council was being punished for being too soft on sinners, so they overthrew them."

"And these Mikes have androids?" I asked. "Which you can't tell from people?"

"So the rumor goes."

"And what do they use these androids for?"

"To kill us," she said.

Which is not something you can argue with at all.

After a while, it got dark outside. We had been here at least two hours, and still there was no sign of Kelly and Peter.

We could hear guns, to the north and occasionally to the east. Sporadically the southern sky would flare up—noiseless, whatever weapon that was, but in the brightness we could see smoke.

"They rarely come this close to downtown," Nicholas assured me as I stood staring out the window.

"What about the bombed-out cathedral?" I asked. "And the chapel?"

Nicholas and Gabrielle exchanged a look. (As in: Oh, these poor half-wits from the future!)

"Larisa," Gabrielle said with a laugh, "we did those. Those were sect churches, spread by the anti-Christ: you know, Catholics, Methodists, that kind of people." She waved her hand like we were sharing a good joke. "Those are war memorials."

Silly me. Damn, where was Kelly?

"Shouldn't they be here by now?" I asked. I had asked the question before.

"Yes," Gabrielle answered. She had answered it before. I could see that she was worried, but apparently not worried enough to go out looking for them.

Finally it was time to sleep. They got out blankets and mats, and the three of us lay down on the floor together. It would have been nice to have a separate room, but the house didn't have any more rooms: just the kitchen, the toilet, and this one. *Kelly,* I thought, *take me away from all this.*

As we lay in the dark, Gabrielle and Nicholas chatted interminably about how good things would be once *my people* were set on the right path by the exiled Council.

It was just a matter, they assured me, of finding the leaders. There were regular List hiding places all over the city. I pretended to go to sleep, and eventually they stopped talking. Their breathing became slow and regular.

I mentally counted to one thousand, then sat up. No reaction.

Grabbing a handful of scarves from the table, I tiptoed to the kitchen. There, I did the best I could about covering my hair and face. By climbing onto the counter, I was able to scramble out the window.

Immediately, I had to remove the veil from my face; otherwise I couldn't have seen a thing. The only light was from a moon not quite half.

I tried to walk in the shadows of buildings. There was nobody else around that I could see or hear, though the sounds of combat were definitely coming closer.

Finally I came to the river. Here was the park. And there the chapel.

And light was pouring out of the tunnel and men in tunics were milling all about. I flattened myself on the ground and crawled as close as I dared, but it wasn't close enough to distinguish their words. I pounded my fist in frustration. Was it worth dying for? All this for another fat folder for Tyler? I slithered back the way I had come until I felt myself distant enough to risk standing.

Now what?

I could return to Nicholas's house. No, I thought; no, I couldn't—not after sneaking out on them. They might come to the conclusion that I really was a spy for the Mikes.

I could stay here and try to keep hidden . . . but then how would Kelly ever find me, if he was still alive? Obviously the List hiding place had been found out by the Mikes. Either Kelly and Peter had gotten out in time, in which case they would have gone to Nicholas's, or they hadn't, in which case they would be dead.

Tyler, I thought, but I didn't know what I wanted to do to Tyler. I just wanted this to be over. I started walking—with no better strategy in mind, heading back toward the place where Kelly and I had arrived.

Footsteps approached, and I pressed myself into a doorway. Three young toughs passed by, close enough to touch. One slapped a big stick against an open palm, saying, "Jesus would've loved it." The night swallowed them up again before the others answered.

Jesus would've loved it, my ass. They would have crucified him all over again.

Another flash from the southern sky. By now, I was once again near St. Darrel's—home of the heathen Catholics. (If all else fails, go back to St. Darrel's: That's the Operating Staff maxim—not because the equipment needs us to be there, but to keep us out of the public eye. That's assuming St. Darrel's is in one piece, of course.) I thought of how pretty the cathedral had been in other times, and of how the women here had picked up pieces of the masonry and hurled them at us. In the street a chunk of concrete shone in the moonlight. I picked it up and returned it to the pile of rubble, then sat down on the curb. Those fabulous windows, I thought: What had they done with those fabulous windows? Then I recalled Nicholas's words: *Thou shalt not create any graven images.*

I picked up a small stone and tossed it gently toward the center of the pile.

Must be midnight by now. Twelve hours to go. I chucked a second stone after the first, and a third after the second. "Goddamn son of a bitch," I whispered. I sat with my knees drawn up: No decent woman would sit that way. I picked up a chunk of plaster and flung it with all my might.

"Goddamn son of a bitch." There was a rock, heavier than the plaster, and more satisfying, though my eyes were blurring. No decent woman would cry on the street, so I just better stop. My hand found a brick, but I couldn't get it unwedged. "Goddamn . . ." I muttered, working it back and forth, "son . . ."

Someone had come up behind me. I felt hands clasp my arms and whirled around, breaking the grip. I lunged for the man's eyes, but now he had hold of my wrists and this time he wouldn't let go.

"Goddamn," I started again, and he pulled me toward him.

"Shhh," he said, and let go of my wrists. He put one hand around my back, and with the other pressed my face to his chest.

I beat at his shoulders with my fists, but didn't have any strength left. I felt the coolness of his skin against my hot cheek, and things finally settled in.

Things like an oversized shirt open to the waist.

"I thought you were dead," I said. "I thought you were dead."

Kelly knelt on the street and held me until my shaking stopped.

We huddled under a picnic bench in the park, as far away from the chapel as we could get and still be removed from the surrounding buildings. I had taken off the white robe, and the two of us had it wrapped around us, like an ugly blanket. (Someone had died in that robe, I remembered.) We had our knees drawn up to our chests and our arms wrapped around each other. We were shivering, both of us, even though it wasn't that cold.

"What happened at the chapel?" I asked.

"Androids," he said. "Looked just like humans."

I moved in even closer.

"About an hour after you had gone," Kelly continued, "Peter was asking about the weapons and I was showing him the max. Then there was a whistle in the tunnel; they knew the code. Peter moved to stand in front of the scanner, and this woman came in. She had taken off her headdress in the tunnel, and she looked like a woman . . . she *looked* like a woman. Peter had shown he was human, and she was coming toward the machine, and he was watching her, and I don't think she had even seen me.

"And there were two of them; one was still in the tunnel. That one had some sort of projectile weapon that knocked a hole in Peter's chest."

Kelly winced at the memory, and I squeezed his arm.

"I fired the max down the tunnel and heard the thing hit, and by then the woman was turning toward me. She'd had her arms up, but she was lowering them, looking like she might have a weapon in the scarves she still had in her hand." Kelly clenched his fist as though to show me what he meant. "And I thought, God, what if she's just some poor woman who was followed here? But I shot her anyway."

"And she was an android?"

He nodded. "Metal parts flew all over. She bumped against the counter, and it flipped over. I couldn't budge it afterwards, and our weapons are still under it, but she —it just . . ." He shook his head. "I touched her hand, Larisa." He looked at his own, then looked up into my eyes. "It felt like skin. She was still warm."

I got him to rest his head against my shoulder.

"The other one was a man. I pulled him out of the tunnel, and he was just like a man. I had hit him in the head, and the face was gone. Just wires, mechanics . . . But the arms, the legs . . ."

"Shhh," I said. "Rest. They weren't real."

"Neither am I," he said.

It took a moment for my voice to come back. "It's not the same. Kelly, it's not the same." I rested my head against his. I wondered if it hurt, getting a brain wipe. But he wouldn't know. No matter how bad it was, no matter how often he had gone through it, he wouldn't know.

I rubbed my cheek against his, and he stroked my arm absently.

The state I was in, I needed more comforting than that.

As soon as it began to get light, we crawled out from under our picnic bench. I took some dirt, damp with dew, and drew a cross on Kelly's forehead. "Has 2460 ever had androids before?" I asked, just to make conversation. Who cared? They had them now. "I don't remember them having androids."

But Kelly got a faraway look, as though he was thinking hard, and said, indecisively, "I . . . don't . . . know."

"What do you mean, you don't know?" I chided him. "Goldblaum knows everything." Goldblaum has been with Operating Staff since the beginning.

"All right," he said, suddenly testy. "Goldblaum knows. But I can't remember." He yanked the ends of his shirt as close together as he could. But then he faced me again, and he looked scared. "Goldblaum's fading," he said.

Personality deviation. It was bound to happen with a rush job like Kelly, and looking back I could see what I had been ignoring. He hadn't been stable from the beginning, from the moment in the control lab when he had decided that Goldblaum was wrong, that it would be easier for me to go on-line knowing beforehand that it would hurt.

I threw my arms around him and held him for a moment, close enough to feel the pounding of his heart. He took a deep breath, regained his composure. "We'll be all right," I told him. "We'll make it." I held him at arm's length and studied him. Maybe. In the half-light. If nobody looked at us.

I wrapped the scarves around my head, probably looking more like an Egyptian mummy than a 2460 woman, and put our one remaining weapon, Kelly's max, into my robe's pocket since Kelly had no place to hide it.

We reached Nicholas's house without incident. By then it must have been maybe eight o'clock—four more hours.

And Nicholas's door was wide open.

I hesitated, trying to peek in, and Kelly started to tug on my arm: If there was trouble in here, we didn't need it.

A young man came around the corner, a real street tough: cross on the forehead, fish on one cheek, dove on the other, the letters JC on the chin—all laser-etched, I was willing to bet; no tattoos for this bravo. He was already narrowing his eyes at us.

I glanced at Kelly, saw that he had smudged his homemade cross by pushing his hair out of his eyes. Trouble was bearing down on us from outside, so there was only one place left to go. I pulled Kelly into the house and closed the door behind us. From the window, I saw the man hesitate. But then he kept on walking. I turned to Kelly and followed the direction of his fixed gaze.

What at first glance had seemed like the empty jumble of sleep mats turned out to be sleep mats and Nicholas. His face was bruised and bloody, and his chest had a ragged hole, the edges of which fluttered with every breath he took.

Kelly knelt next to him. Nicholas looked past him, at me. "Androids," he wheezed. "Got a machine, can copy human faces." Every syllable sounded as though it might be his last.

I folded one of the blankets and pressed it against the wound. His hand clutched mine.

"Gabrielle."

I glanced at Kelly, who looked as sick as I felt. "No, Nicholas. It's me, Larisa."

"Gabrielle," he repeated. "Gone to market with friends. They made me tell."

I nodded. I was holding the blanket with one hand, squeezing his hand with the other. The bleeding hadn't stopped, only slowed.

"Told them about her. Told them about *you*. They copied me."

I swallowed hard. "Yes."

"They'll have it join her, go to Council meeting, kill Council." He shook my hand. "Copied me," he repeated.

"I understand," I said.

There was a noise in the kitchen. I recognized that sound, the reverse of what I had made last night: someone coming in through the window.

I stood, pulling free of Nicholas, and got out the max.

Next to me, Kelly stood too.

The kitchen door opened, and Peter was standing there. Peter, who—by Kelly's account—was dead.

For a second his eyes focused on the max; then, in a voice of horror, he cried, "What have you done to Nicholas?" And then he glared at Kelly. "You!"

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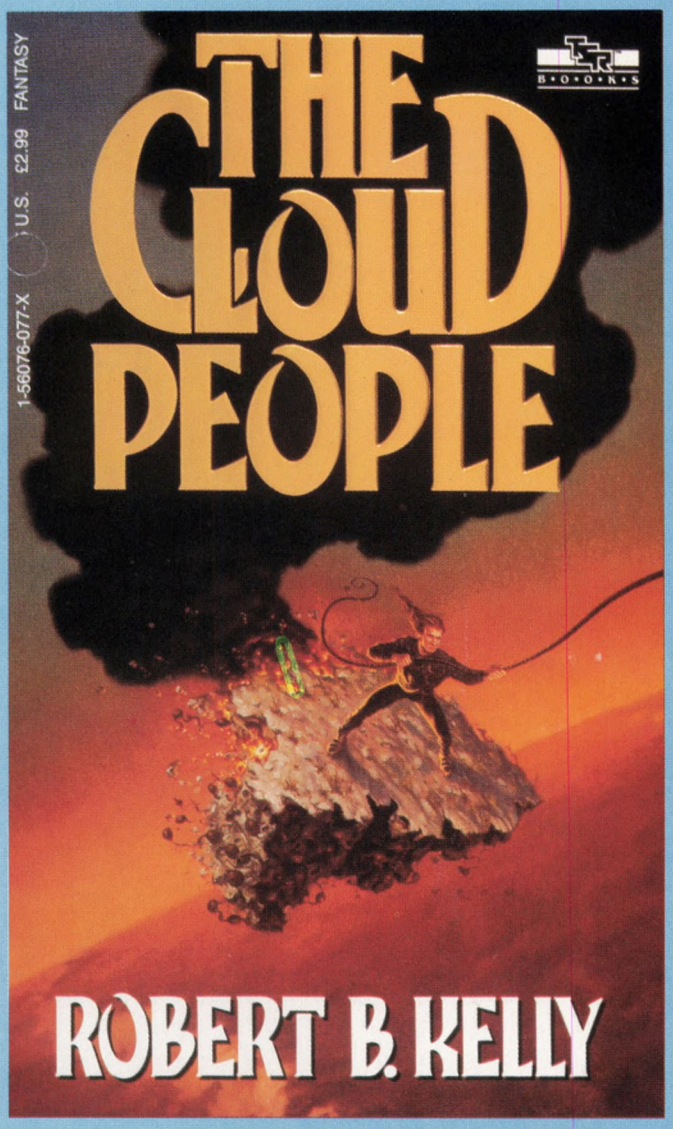

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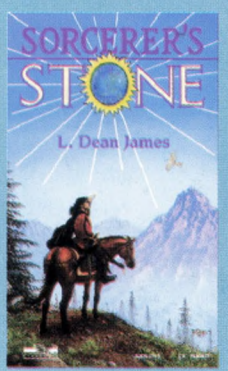

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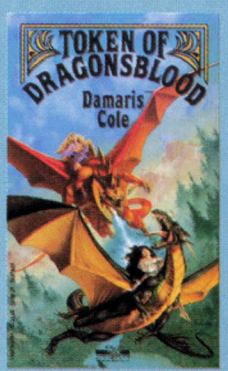

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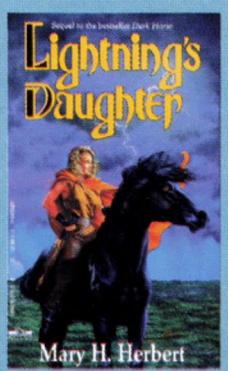

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Nicholas gave one last ragged wheeze, clutching for my hand, and then he was abruptly silent. I glanced at him, saw that his chest was no longer moving. In that instant when my attention wavered, Peter tore into the room, colliding with Kelly. Both went crashing to the floor between the wall and Nicholas's body.

"Stop it!" I cried. Peter was quicker, but Kelly stronger. I didn't wait to see how it would shake out. I blew a hole in the wall about twenty centimeters above their heads.

They backed off, each eyeing the other warily.

"Down," I snapped as Peter scrambled to get to his feet.

He knelt, but pointed at Kelly. "That's an android. They broke into the chapel and copied him. I got away."

Kelly glanced from Peter to me and shook his head.

"I'm telling you," Peter said. "Are you willing to bet your life that this is the same man you came here with yesterday?"

Now *I* was having trouble breathing. Willing to bet? No, I knew for certain that Kelly wasn't the same. Yesterday he had been Goldblaum. Today . . . Today he couldn't answer a simple Goldblaum question. Personality deviation. Wasn't it?

Kelly's face was drained of all color.

Could androids pale? Their skin felt like real skin. I knew because Kelly had told me so. Their hands could be warm. Did they have artificial hearts whose beat you could feel when you held them close, artificial lungs to inhale? The ability to make love?

Peter must have seen that he had hit on something. "Do you remember anything different, Larisa?"

Yeah. Yeah, I did. I remembered a foul-mouthed young tough who—*I was willing to bet*—wasn't smooth enough to play this game. If I was wrong . . .

I leveled the max at Peter and fired.

He flew apart with a metallic *twang*!

Kelly had jumped. I don't think he had known who I was going to aim at. I hadn't known who my target would be, till just before it was done. He took a deep breath and looked at me like: Don't you ever do that again. He started to get up, and I forced my voice to be steady as I said, "Down."

He slid back down the wall to his knees, watching me all the while. "Peter was the android," he said.

"Yes," I said. *Oh, God,* I thought, *I want to go home. Can't I go home before I have to do this?*

Kelly was looking at me steadily. "But . . ." His voice was almost too soft to hear. ". . . I could be one too."

My hand was shaking, and I had to hold onto the max two-handed. I tried to drive away the memory of his arms around me last night. "I'm sorry. I can't be sure. I can't take the chance."

For a second his eyes wavered. He glanced around the room, but then he looked at me again. (Could they copy the green of those eyes?) "What about," he said, trying to be reasonable, "Tyler and Operating Staff? An android wouldn't know about them." He must have thought about Nicholas's words then: *They made me tell.* He swallowed hard, searched for something else, started to say that, dismissed it before getting a word out.

I waited, knowing there was nothing he could say that would convince me beyond a doubt. But still waiting. *Convince me, Kelly. I don't want to kill you.*

"God," he whispered, and braced himself.

I steadied the max. Steadied the max. Steadied the goddamn max.

I grabbed Kelly by the arm and hauled him to his feet. "Breathe wrong, and I'll blow your head off," I warned.

"Who's breathing?" he asked.

I had Kelly sit on the clothes chest, where I could keep an eye on him. I placed one of the sleep mats over Nicholas's body. Another I threw over the android. The thing had bled, or at least it had bloodlike fluid in the layer between its skin and the plastic padding over the metal. No doubt that was what gave the skin the feel and appearance of being alive. It also prevented me from doing an easy experiment with Kelly; a nick would bleed in either case.

I sat on a chair across from him. The max was in my pocket—ready, but let's not be overly dramatic. I kept going back to Peter, over and over: what he had said, what I had reasoned. How, despite all that, I could have guessed wrong. Over and over. The clock chimed nine. Three hours . . . and seven minutes.

"Are you assuming," Kelly asked, "that she's coming back here before she goes to the Council?"

"I certainly hope so."

The clock ticked noisily. Finally he said, "But it depends on where the Council is meeting. She might go directly from the market."

"Yes," I said. "But I don't know where the Council is meeting, or where the market is."

He didn't rise to the words or the tone. "Neither do I. But I do know the Mikes will kill her if they get a chance."

"I hope they don't," I said. *Hurry home, Gabrielle.* I glanced at the lump that had been Nicholas. Husband? Brother? Friend?

The clock continued to tick.

"She won't come back, and they'll kill her."

"You don't know that," I said. "Besides . . ." I shook my head. "This is not a workable time line. They'll change it. Operating Staff will send someone else to 2427, same day as Olin's team, but slightly earlier. They'll warn Olin not to kidnap Silver, that things are better in 2460 with Angel Saroya than without. None of this will happen."

"We think," Kelly amended. It was an old Time Management debate—whether a time line we erased continued, in some alternate reality, to exist. I had enough trouble with our own reality.

"We think," I acknowledged.

"Peter mentioned something last night," Kelly said. "Do you know who she is?"

"Gabrielle?"

"Her last name?"

I shook my head.

"Saroya. Gabrielle Saroya." More urgently, again: "Do you know who she is?"

Shivers up and down my spine. Gabrielle. Silver's daughter. Except that Silver never had a daughter. She had a son: crazy Angel, who grew up to declare himself Dictator-Appointed-By-God. Except in this time line. Only in this time line did Silver miss an appointment with Angel's father, and consequently have Gabrielle instead. This time line, which, in another three hours, I would be recommending for erasure. Even I, who get headaches thinking about paradoxes and intricacies, could figure that out. That only left the theoretical possibility that what we changed for ourselves would continue unaffected for the people here.

"This is her only chance," Kelly said. And I could make the connection there, too, why it would be so important to him, whose reality was redefined every time he was pulled out of storage.

"Damn!" Why couldn't I just wait here, safe if not comfortable, until the equipment pulled me back? Either with Kelly alive, which meant the Mikes hadn't gotten to him —which was what I wanted more than anything—or with Kelly dead, which meant this was an android sitting here tormenting me with talk of a woman who might never exist but was about to die, a woman who had taken me in despite the fact that I looked and talked in ways that shocked her very soul. Whether or not this version of 2460 continued to exist was a question for philosophers, but I sure as hell knew that I existed and wanted to keep on existing, and if I ever got back to AT&T, I was going to tell them what they could do with Time Management Division in general and a certain T. Raymond Tyler in particular.

I threw myself out of the chair and stamped into the kitchen, where there was a bookshelf.

The first book had no inscription. I dropped it on the floor. The second was identified as the property of *Nicholas Durani*. On the floor. The third: *Nicholas*. The fourth—there: *Gabrielle*, written in fastidious simplicity, no last name. Floor. Another blank one. Another. Then: *Gabrielle S.* I felt my heart fluttering near the base of my throat. *To Nicholas D. and Gabrielle S., Happy Creation Sunday—T.K. and F.S.M.* Another *Gabrielle S.* And another *Nicholas Durani*. And yet again *Gabrielle S.* Didn't the woman ever use her last name? I flung the book to the floor and swept the rest off the shelf.

Kelly had come in behind me. I jumped, having resolved not to leave my back to him till I found out for sure, one way or the other. But he only watched me with those clear green eyes.

"All right!" I yelled at him. "All right! All right!"

He took me by the shoulders.

I forced myself to relax. "All right."

Nicholas had a couple of extra tunics. One was obviously for sweat work; the other was a decent-looking alternative to the orange and green he had been wearing when the Mikes got to him. This one was indigo. Tight across Kelly's shoulders, but wearable.

I left him strapping on the fleecy leg-warmers that the men wore while I went outside and got another clump of dirt to redo his forehead cross. When I came back in the house, he was sitting on the chest, exactly as I had left him—obviously on his best behavior. "Try not to sweat," I suggested as I drew the sign.

"All right," he answered, as though it had been a reasonable request.

You don't know, I warned myself, stepping away. *Not for sure.*

He shifted his gaze to the floor.

"Come on, we've still got to find the market." I couldn't shake the thought that perhaps things were further along than I knew. Perhaps Nicholas's android had already failed, had not fooled Gabrielle into leading the Mikes to the Council meeting. Perhaps the Mikes were counting on me to do it.

As the door closed behind us, I heard the clock chime 10:15—just under two hours.

The market wasn't hard to find. Everyone was coming back from it. Groups of women walked together, baskets slung over their arms, always with at least one male in the company. We followed the trail backwards, noticing more and more damaged and boarded-up buildings as we left the center of the city. By the time we reached the large area with stalls, there was no sign of Gabrielle.

The clock in the square sounded 10:45—an hour and twenty-two minutes.

"Excuse me," I said to a man selling leafy green something-or-others. "I'm looking for Gabrielle."

He shook his head. Next I approached a woman who was buying some fish.

"Excuse me. I need to find a woman named Gabrielle. It's very important."

The woman shrugged, glancing at Kelly.

"Please," I insisted to a shopper who was steadfastly ignoring me.

And, to another: "It's important."

"You!" a loud voice called. "What are you two up to?"

Kelly and I both turned slowly.

A man stood there, his arms folded across his chest. He had a tattooed chain of fishes around one wrist, and doves on the other.

"Peace of Christ be with you," Kelly said.

"And with you, brother. What are you up to?" The man took a step closer, his eyes shifting from my out-of-balance headdress to Kelly's tight-fitting tunic.

Kelly looked at me like: Now what? Now what, indeed. I tipped a nearby fruit display, sending apples, grapes, and oranges flying.

The two of us ran. As we turned the corner, I glanced back and saw that the man with the tattoos had gotten tangled up with the vendor, who was scrambling to retrieve his fruit.

Beside me, Kelly had stopped dead. Two other locals blocked our path. One held a blackjack, the first weapon I had seen carried in daylight.

The second beckoned for us to step into a doorway. The building he indicated was boarded up, but one of the boards was loose, and he swung it out of the way. The first man pushed us inside.

It was dusty and dark. The only light, the only air, came from the haphazardly boarded windows.

"So you want to see Gabrielle?" the one with the blackjack asked, tapping it against his fingertips.

The other one didn't wait for an answer, but patted Kelly up and down, apparently looking for weapons. I hoped that as a second-class citizen I'd be exempt, but I wasn't. He found the max.

They tied us together, sitting on the floor back to back, with our hands behind our backs, using the same plastic filament Peter had used in the chapel. Must be standard Fundamentalist supply.

"Gabrielle's life is in danger," I told them. "The Council is in danger."

"You, woman," the first one said, pointing the blackjack at me, "you're the one in danger."

"There's an android," Kelly said, "that looks just like Nicholas—"

The man kicked him hard in the ribs. "They know about the meeting," he complained to his companion.

"Everybody knows about the meeting," the other man said.

"Want me to bash 'em? Bash 'em for Jesus?"

The other man considered that for a moment. "No. No, maybe they're just innocent crazies. Everybody's seeing androids behind all the bushes lately."

"I don't have to bash 'em real hard."

"No, we'll just leave them here. It's almost eleven o'clock now. If we spend any more time here, we'll be late. Leave them here and go to the Hall. We can bring it up during question and answer. Council will tell us what to do."

The one with the blackjack sucked his teeth, but in the end left along with his companion, with no more violence than a parting kick to my leg.

"Can you move?" Kelly asked after we were sure they had gone. "Lean forward. No, lean back."

I could feel him squirming, trying to work his leg around and back. "What are you doing?"

"I've got a knife in the leg thing."

"You've got a *what?*"

"Sorry. I took it from the kitchen while you were outside."

What a wonderful guard I made.

"Can you get it? I think it's closer to your hand."

"You're breaking my back."

We straightened and sat quietly for a moment. I tried to ignore the kinks and twinges. Damn, I was hot in this stupid outfit.

"All right." I got my hand on his lower leg, on the strapped-on leg warmer.

"Higher. It's near the top."

I couldn't feel it, but I tugged the fleecy material down from his calf, and there it was. It was a small paring knife, which was why our captors had missed it; they were looking for bigger stuff.

"Hold on. Let me get my leg straight."

Outside, the clock in the square sounded 11:00—one hour and seven minutes.

"Stop moving," I said. I got the knife between my right wrist and the plastic cord. My hands were slick with sweat. What if I put too much pressure on the knife? It would cut through the plastic and gouge our wrists.

The damn thing wouldn't cut. I began sawing. "Some knife you picked."

"Sorry."

He meant it. I glanced back at him. "Well. It's better than the knife I picked. . . . There. Did that make it any looser?" We twisted and turned. No, it hadn't.

My arms ached from the effort, and my leg ached from where the buffoon had kicked me. *Come on, come on.* A second strand parted.

That time we could feel the difference. Not a loosening, exactly, but a lessening of pressure.

The clock bonged 11:15.

Two strands gave way at once.

The bindings went slack: Kelly had gotten his right hand free. We wriggled ourselves out of the collapsed bundle of knots.

He rubbed his wrists. They were as bruised and raw as mine, which—a niggling part of my brain reminded me—they would be in any case: I had seen how Peter's android was constructed.

I hugged him anyway, returned his knife. Surely his actions proved this was really him. Didn't they?

He helped me to my feet.

"Hall," I said.

"Some place that's about a ten-minute walk from here," he reminded me.

Still, it could be almost any building in a ten-block radius. If we couldn't narrow it down, we'd never find them. I did some thinking out loud. "A hall . . . ten minutes' walk . . . that could mean Town Hall."

"Could it?" Kelly's voice was even, neither one thing nor another.

I kept mine the same. "Town Hall's almost always on Krellis."

He nodded, slowly. He knew what I knew: If the Mikes were in control, then Town Hall was enemy territory.

Who would think to look for a Fundamentalist meeting inside a bastion of the Avenging Arm of Michael? They might try it.

What did we have to lose . . . besides our lives?

Our lives, that is, assuming Kelly was what he seemed to be and not what Peter had been. . . .

A block from Krellis Street we passed a hardware store with a clock in the window. 11:24. Forty-three minutes left.

The Town Hall was where I had hoped it would be, all in one piece and functional. I glanced at Kelly as he pushed open the door; the cross on his forehead was just about gone. "Hair," I whispered.

He knew what I meant and tossed his head so that some of the sandy-colored hair fell across his brow. No one covered the sign that way here, but it was not so obvious as the clear skin.

There was a big reception desk, with a local sitting

behind it. He put down the book he had been reading, a Bible. "Our Lord reigns. What can I do for you?"

"Hallelujah," Kelly answered. "We're supposed to meet some friends, who are here for a meeting."

"What sort of meeting?"

"Well, that's a problem; it's kind of a special—"

"Lots of meetings going on today."

"Could we maybe—"

"People don't like strangers looking in on their meetings," the receptionist said, anticipating him.

"The person we're looking for, his name is Nicholas."

The man shook his head.

"Gabrielle?"

"Don't know them. Sorry."

"My," I said. "It's hot."

The local looked at me for the first time.

I fanned my veiled face with my hand and made my voice go fluttery. "Isn't it?"

"Maybe she needs fresh air," the guard suggested.

I clutched Kelly's arm and sagged. "No, I'm all right. Just give me a moment." I let go of Kelly's arm. Both men looked at me apprehensively. I flopped to my knees, flailing my arms, taking as much of the desk clutter with me as I could: nameplate, papers, pencils, a box of disks, the Bible. "Sorry," I said in a little voice. "Oh, dear, we'd better go home."

"Yes," Kelly said, supporting my arm, "of course. We're sorry to have bothered you. Jesus loves you."

The local, bending down to gather his possessions, mumbled back, "Jesus loves you, too." His hand came up, replacing the nameplate. He scrambled for something that had rolled under the desk.

I dug my elbow into Kelly's ribs, and finally he caught on. He bent over and picked up the heavy, leatherbound Bible. "Here, let me help you," he offered, going around to the side.

I heard a dull thud; then Kelly eased the man completely back under the desk. He rested a moment, stooped beside the desk, his head against his knee, looking shaken. He wasn't cut out for this sort of thing.

But, then, neither was I.

The clock above the desk showed 11:32.

"That receptionist isn't going to stay unconscious forever," Kelly said. "And all it's going to take is one person looking for him or for something from his desk—"

"I know."

We didn't try to be unobtrusive, to peek in around the doors. We knocked and walked in.

I would stand by the door, holding it open; Kelly would stride in, locate the waste paper container, and walk out with it. We figured that gave us two chances: one, for us to spot Gabrielle; two, for her to spot us. We were met with a lot of sudden silences and dirty looks, especially if the containers were empty already. We took them anyway, and left them scattered in the hallways. We did all three floors, offices and meeting rooms alike, main floor, sub-level, upstairs. Nothing. It was 11:47. Twenty minutes.

By this time I felt as lightheaded and watery-kneed as I had earlier pretended to be. "We guessed wrong," I told Kelly.

"Yeah."

I tried to convince myself that there probably wasn't any such thing as parallel time lines. I said, "We better find an empty room, wait tor the equipment to pull us back."

"Damn." But he nodded.

I kicked one of the waste containers, and it rolled noisily across the floor. *I'm sorry, Gabrielle. I did try.* "Come on."

We started down to the main floor, where we had seen an unoccupied room. Two locals were in the reception area, bent over beside the receptionist's desk. We spun around and headed back upstairs.

There was no place to hide up here: two meetings we had disrupted already, three offices.

I opened one of the office doors. One local here, sorting through a pile of papers. We had disturbed her already. I said, "Excuse me, I'm feeling faint. Is there somewhere I could sit down?" *Some nice place where no one can see us for, say, the next eighteen or nineteen minutes?*

The woman behind the counter looked up, her face indistinguishable behind her veils. "No, there's only the conference room back there. The room with the cot . . ."

Kelly looked at me, then swept past her, down the little corridor we had assumed led to the back part of the office. I ran after him, followed by the office worker. "Wait," she said hesitantly. "Excuse me. Excuse me. Brother, sister."

Kelly flung the door open. I peeked over his outstretched arm. Four startled faces looked up at us, none of them familiar. "Sorry," Kelly murmured. "Wrong room."

"I told you . . ." the office worker said.

"I misunderstood. Thought there was a cot in here."

We got out of there as fast as we could.

"There was an office like this on the lowest level," I reminded Kelly.

We moved to the head of the stairs. The receptionist was sitting up now, leaning his head into his hands. Several more people were in the reception area, and as we stood there the front door opened and three more locals walked in. They were all, I thought, marked with more symbols than the average 2460'er. And they had weapons.

Behind us, the door to the office we had disrupted opened a crack, knocking one of our abandoned waste paper containers.

"This is it," Kelly hissed at me.

I nodded. The Council was meeting in that downstairs office, and the Mikes were closing in. We started down the stairs as the clock sounded noon.

At the bottom, we had to pass through a crowd that was trying to see what was happening with the receptionist while still keeping out of the way.

"Peace of the Lord," Kelly murmured. We were closer to them than was safe, squeezing between them. "God reigns."

Halfway through the reception area, I saw the front door open. If I hadn't known better, I would have said that was Nicholas who had just entered.

"Excuse me," Kelly said, shouldering aside one of the locals.

"Take it easy," the man called after us.

Then: "Hey!" someone yelled. "Hey! You!"

I lifted the white robe up around my waist to keep from floundering as I ran down the stairs. Kelly passed me, hit the door fast.

From behind came the sound of feet pounding down the stairs.

It was the same setup as upstairs: counter in the front, narrow corridor to the right. There was a man in this office, and he wasn't as subdued as the woman upstairs. He moved to block our way. Kelly shoved him back, and when he tried to cut me off, I kicked him in the shin.

Angry voices closed in behind us.

Kelly flung the back door open. A lot of people here —that was my first impression: forty, maybe fifty. At our appearance, voices were raised in protest and alarm, chairs scraped on the floor, weapons appeared out of nowhere.

"Mikes!" Kelly shouted, risking everything in that warning.

"You!" a familiar voice snarled. One of the men who had tied us, the one with the blackjack, had been sitting by the door and was now reaching up the sleeve of his tunic looking like there was nobody in this room who could stop him from bashing us now.

"They're with me!" That was Gabrielle, trying to push her way through to us.

"Mikes!" Kelly repeated. "Right behind us!"

"Block the door!" someone ordered.

The door was slammed shut behind us and people started dragging tables and chairs in front of it.

There were four windows close to the ceiling, maybe two meters up and another meter tall, and some of the Lists were already scrambling out that way. Others were crowding through a waist-high doorway that looked like it might lead to the sub-basement. A few settled in to fight.

Someone hit the door from the other side, rattling it in its frame.

Gabrielle grabbed my hand. "This way." She headed toward the basement route.

The door was struck again. Wood splintered, and we were last in a line of ten people trying to squeeze through that little door. I ripped off my headdress and started to wriggle out of the confining white robe.

The tables scraped across the floor, first toward us, then away as those manning the door threw their weight against them. Somebody switched on a weapon that gave off a high whine, possibly a primitive scrambler. I would have given anything for mine now, or the max, or any of the other weapons.

It had to be 12:03, 12:04 by now. Three people ahead of us.

The door exploded. No telling what the Mikes used, but the smell of ozone and smoke filled the air. Three of the Lists who had been closest to the door were down, and the other four were backing away.

The Mikes started firing into the room, an assortment of beams and projectiles. Something hit the woman ahead of us, just as she crouched to step into the passageway. She dropped, her back smoking, blocking the way.

I grabbed an arm, Kelly a leg, and we heaved her to the side while Gabrielle fired her laser cutter over my back. She got one of the Mikes, but two more of the List defenders were down.

"Go!" Gabrielle shouted.

I looked up. And saw one of the Mikes aiming a gun, at least as big as the max, at my head. *Shit,* I thought; no way could it be 12:07 yet.

Kelly pushed me. Hard enough that I fell on my rear end in the basement passage. Hard enough that he didn't have time to withdraw his arm from the space that had been occupied by my head a second before. The force of the weapon's impact flung him against the wall.

He doubled over, his right hand pressing against his left elbow, which was spurting blood.

I started to scramble back into the room, but Gabrielle screamed, "Move! Out of the way!" She grabbed his right forearm and half dragged him in with her.

He barely got clear of the door before sitting down heavily. "Damn," he said softly. Shivering. Going into shock already.

I threw my arms around him and almost knocked him over. I remembered how close I had come to shooting him for being an android, and my teeth started chattering also.

One last man crawled in after us. He flung a cylinder back out into the room, then swung shut a heavy metal door that latched from this side.

There was a moment of musty darkness; then Gabrielle switched on one of several portable lamps that were in a niche by the door. She pulled off her veils and started wrapping Kelly's elbow to stem the bleeding. He was breathing fast and shallow, and seemed distant from what was going on around him. "The joint's shattered," she told me. "That's going to need looking after fast."

There was a low rumble from the thrown cylinder that we could feel as well as hear, and the man who had thrown it grinned with a face blackened by the smoke of the fighting. It took a moment for me to recognize him as the man with the blackjack.

"That'll hold them for a bit," Gabrielle said. "There's a maze of interconnecting passageways down here. We can exit any one of several places going halfway down the block. But we must go now."

"No," I said, "you go." Then, seeing that she misunderstood, "We're going back. Any moment now."

Her eyes widened.

"Gabrielle"—damn, I was going to have to be fast, too fast for this kind of news—"Nicholas . . . Nicholas and Peter are both dead."

She turned her face from me.

"The androids the Mikes make . . . they can be made to look like specific people. At the market, that wasn't

Nicholas; that was one of them. It followed you here, then left to lead the Mikes here. Gabrielle, I'm so sorry." I put my arm around her shoulder.

She looked up at me, her eyes looking red and sore, but no tears. "Take me with you."

God. "We can't. Gabrielle, if we could, I swear we would, but the time equipment only works one way: to the targeted year for twenty-four hours, then it snaps us and only us back automatically."

She sighed. The light from her lamp was right near her face, so that there were no shadows and little color. "At least," she said, "at least you give us hope. Your future is very strange . . ." Her eyes strayed to my open shirt, to my hair, to Kelly's strained but still beautiful face. ". . . but at least we know we will survive."

Her light was beginning to hurt my eyes. She leaned forward and took Kelly's face between her hands. He blinked; no telling how much he was aware of at this point. She tipped his face down and kissed his forehead, where there was no cross. "God's peace be with you, Kelly." She turned to me but her hand seemed to pass right through me. "God's peace, Larisa," I heard her ı say, as though from a great distance.

Then the celestial hand again seemed to turn me inside out.

The first thing that happened when we got back was that Kelly passed out. He collapsed, knocking loose Gabrielle's makeshift bandage, and started bleeding all over Company equipment.

The second thing that happened was that I threw up—not as dramatic, but at least as messy.

Not what Goldblaum would call an auspicious homecoming.

Medical Technologies had to be called in for both of us, which resulted in Corporate attention being focused on Operating Staff when Tyler was least ready for it.

Olin's time line was, of course, a fiasco. And everybody jumped on Tyler because he obviously had not thought it out well enough. Then, when Division leaders began to look at the last several line reports, it became obvious that quite a few things hadn't been well thought out.

Goldblaum was marvelous. He had been calling the Chairman of AT&T even before I got back, protesting that he had agreed to a gennie substitution only on the condition that an assistant-level line operator also be added to the team. Which, of course, Tyler conveniently forgot to mention to either Kelly or me. Well, as I said, Goldblaum has been around since the beginning, and he carries a lot of weight. Tyler was an ex-AT&T employee before Kelly regained consciousness.

Considering all the people who have given their life's blood for Operating Staff, who have worked there for decades, who have more doctorates than they have wall space to display them, it's not surprising how Tyler's replacement was chosen: The job went to Zorana, the Chairman's niece.

I bought Kelly's contract before they could do a brain wipe. They gave me a big discount because he had been damaged, though the elbow should regain close to ninety percent mobility eventually. Sometimes he wakes up with bad dreams, unable to remember who he is, but that's getting better with time too.

Time travel . . . God, time travel gives me a headache. They're still trying to straighten out 2460.

There's time enough for 2460: That's what they told me when I first joined the company. (Another Time Management joke, and the last one, I promise.)

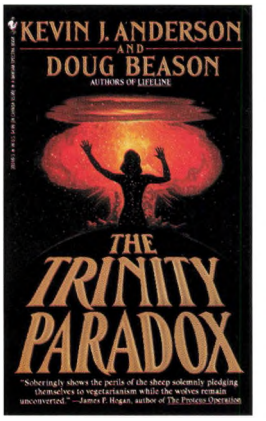
Time enough. For what? I wonder. For the decent woman whose white robe I wore? For St. Darrel's Cathedral to be picked apart, stone by stone and glass pane by glass pane? Certainly time enough to forget time travel: They always assume we're from the future. As though people from the future would want to change what was done and past, to take the time—so to speak—to fine-tune and correct the little mistakes.

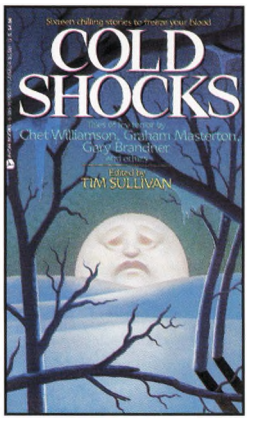
Truth of the matter is, it's the people from the *past* who care, when they find out that the message from the future is: Nobody home . . . so that even 2460 is an improvement.

We went to St. Darrel's, Kelly and I, one of the first days he was out of the hospital. And we lit a candle for Gabrielle.

(I hope she doesn't mind.) ✦

Book Reviews





The Trinity Paradox
by Kevin J. Anderson
and Doug Beason
Bantam Spectra, November 1991
325 pages, $4.99 (paperback)

As an intimate ethical drama about weapons research and the Manhattan Project, the latest collaboration from Kevin Anderson and Doug Beason is as compelling as one might wish. Their tight focus on anti-nuclear activist Elizabeth Devane, however, casts shadows on what would otherwise be an intriguing alternate history yarn.

The book opens in the present, but quickly shifts to 1943 when Elizabeth's efforts to sabotage an experiment at Los Alamos coincide with a freak explosion that sends her back in time. A bit of fudged bureaucracy enables her to sign onto the Manhattan Project staff, where she is in an ideal position to help or hinder its eventual success.

The catch is that Elizabeth really isn't the major catalyst for the historical divergences that begin to occur. That role goes to British scientist Graham Fox, a Project observer described by the authors as the only other major character not based on a historical personage. It's Fox whose roundabout note to a German scientist results in a dramatic acceleration of Nazi nuclear research and the death of Dr. Werner Heisenberg. And it's Fox whose final act of sabotage threatens the destruction of the entire Manhattan Project. Neither action relies convincingly on Elizabeth's intervention for its plausibility, and as a result, it's far from clear that this alternate history is really her fault.

As long as the historical speculation sticks close to the nuclear research teams, though, it retains an air of meticulous authority. That atmosphere thins late in the novel, when Anderson and Beason introduce changes in American political circles. Too little foundation is laid for these, and between this and a rushed wrap-up, the authors' imagined conclusion of World War II loses some of its power.

But while *The Trinity Paradox* gets mixed marks as alternate history, it confirms its collaborators' reputations for creating memorable characters who react with human uncertainty in times of crisis. In particular, fans of striking, intelligent female leads will find Elizabeth Devane an intriguing personality. And if history buffs aren't entirely satisfied with this twist on reality, they should at least enjoy the process of picking it apart. — *JCB*

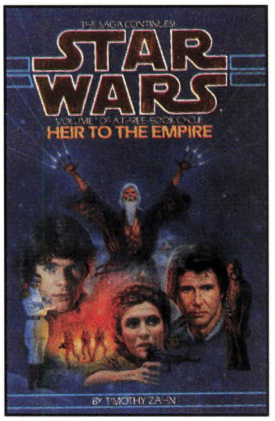
Mairelon the Magician
by Patricia C. Wrede
Tor Books, June 1991
280 pages, $17.95 (hardcover)

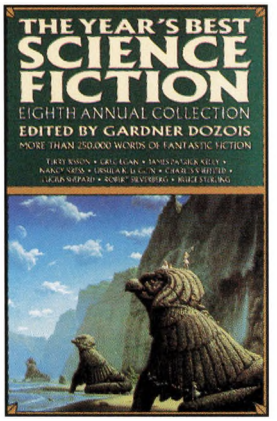
Patricia Wrede has always had an effortless, deft writing style that makes her novels reliably light, entertaining reading, and this newest fantasy is no exception. In addition, *Mairelon the Magician* finds Wrede playing with a variety of literary and theatrical influences, generally to good effect. If there's a technical complaint to be made, it's that she stuffs an awful lot of plot into a relatively compact space, to the extent that keeping track of the secondary characters is something of a challenge.

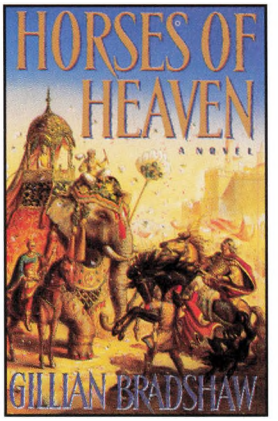
The milieu is much like that of Wrede's earlier collaborative novel, *Sorcery and Cecelia*, a version of Regency England in which magic works and intrigue among the nobility is almost a matter of course. This time, though, we start with a Charles Dickens premise: street urchin Kim takes on a commission to investigate the effects of itinerant conjurer Mairelon, only to discover that her target is much more than a sleight-of-hand artist.

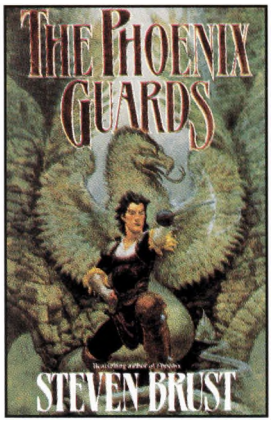
The story promptly shifts gears and becomes a McGuffin hunt, with Kim and Mairelon joining forces to trace the whereabouts of the Saltash Platter, a stolen artifact of tremendous value both by itself and as part of a matched set of magical objects. Before long there are several sets of would-be owners dogging each other's tracks—and almost as many copies of the platter making the rounds.

As the various adversaries converge, the style changes again, openly assuming the air of "Drury Lane comedy" (as Kim describes it) for an elaborately staged climax that occupies nearly a quarter of the book with surprise entrances, unmaskings, revelations, and assorted pyrotechnics. The dialogue is crisp and the









choreography ingenious, and one might readily expect a theatrical adaptation of the novel to be forthcoming.

There's one other literary resemblance worth noting, though the comparison is beginning to be overused: *Mairelon the Magician* is also a literary descendant of all the Andre Norton fantasies and swashbucklers ever checked out of the childrens' room at the library. (Offhand, I can't think of any reason the book couldn't have been marketed as a young-adult title, save that the adult market likely represents a larger audience.)

It's easy to be enthusiastic about this novel; it's harder to give it context in Wrede's career. She's proven by now that she's a first-rate writer of light fantasy adventure. But should she be praised for consistently providing well-crafted entertainment, or chided for not applying her obvious talents to more ambitious projects?

There are traps in either conclusion. I'd like to see Wrede stretch her literary muscles farther, but it's hardly fair to fault her for doing what she does well. For the moment, her readers should be well satisfied, and that's what really matters. — *JCB*

Cold Shocks
edited by Tim Sullivan
Avon Books, August 1991
309 pages, $4.50 (paperback)

There's been a lot written in recent years about the evolution of horror fiction, how it's changed and evolved into a thoroughly modern mold. That may make *Cold Shocks* a bit of a surprise, because most of its horrors are thoroughly traditional ghosts, myths, and monsters, with scarcely a hint of splatterpunk to be found.

That's not to say that there's no bloodletting in the anthology; Chet Williamson's "First Kill" doesn't pull punches in its portrayal of a hunter whose prey is outside the norm, and Gregory Frost has a nasty surprise in the back of "The Bus." But the violence here is usually not gratuitous, and it serves as a byproduct of the horror rather than its source.

In accordance with the title, all sixteen stories are set in wintry locales, but within that restriction a wide range of milieus are represented. Gary Brandner's "The Ice Children" is one of three tales to invoke Eskimo lore, but his creatures of the polar regions are a far cry from Michael Armstrong's "The Kikituk," which reaches down into urbanized Alaska, and Steve Rasnic Tem transplants his "Adleparmeum" to Colorado. At the opposite pole, Graham Masterton weighs in with a story that is more supernatural than horrific. And while Melanie Tem and Edward Bryant offer different variations on the "cabin fever" theme of characters confined in a remote wilderness shelter, A. R. Morlan and editor Tim Sullivan present chills that begin squarely in the midst of modern suburbia.

The anthology's two real highlights are a study in contrasts. Dean Wesley Smith's brief "Christmas Escape" is a quiet, evocative story involving a ghost in a nursing home; its message is familiar, but not overstated, and the execution is sharp and perceptive. "The Pavilion of Frozen Women," meanwhile, finds S. P. Somtow working at novella length to unfold a complex cross-cultural drama involving ancient curses and a very modern murder mystery. Somtow capably balances his formal Oriental setting with his heroine's no-nonsense first-person narration, and the result is a tale that admirably caps the volume.

In terms of the stories, then, *Cold Shocks* is an anthology without a down side, and horror readers should find it a winner. But keep a wary eye on Tim Sullivan's biographical notes. The copy in the galley appears to date from mid-1989, so that you may see references to "forthcoming" works that have long since appeared in print. — *JCB*

Heir to the Empire
by Timothy Zahn
Bantam Books, June 1991
361 pages, $15.00 (hardcover)

Timothy Zahn's work has interested me since it began appearing in *Analog* about a decade ago. He was a good writer then: decent prose, good characterization, vivid descriptions, strong plots. His first novel, *The Blackcollar*, was a formula small-band-of-humanity vs. alien oppressors novel which showed his current strengths and seemed to point to big-

ger things to come. Of the dozen books that preceded *Heir to the Empire*, though, none was a real genre breakout.

But it seems Bantam took interest in Zahn. As I write this article, *Heir to the Empire* is firmly ensconced in all of the national best-seller lists, so their choice would seem to be right.

But what about the book?

It's quite good *as a novel*, which I suspect is why Bantam chose a novelist rather than an experienced novelizer like Alan Dean Foster, who would seem a more natural choice to many people. (It should be noted that Foster has written original work in this universe—a lame sequel to *Star Wars* called *Splinter of the Mind's Eye*. *Splinter* is best forgotten.)

Heir to the Empire is the first of a trilogy. The three books follow George Lucas's plots for movie sequels to the original *Star Wars* . . . movies that Lucas no longer intends to make. Here, the Rebellion has set up the New Republic to rule the star systems they've wrested from the Empire. Political maneuvering is fragmenting the government, cargo ships are in short supply, and Leia, Luke, and Han are working hard to try to hold everything together.

The Empire is far from out of the fight, though. What's left of it is now under the rule of Grand Admiral Thrawn, a brilliant military strategist. Thrawn is demonstrably better at running the Imperial fleet than Darth Vader ever was, and under him the Empire is making inroads into New Republic territory.

Luke, Leia, Han, Chewbacca, Lando, C-3PO, and R2-D2 are all prominent characters. There is more than enough roller-coaster action to satisfy anyone. Thrawn is a more than capable villain.

For fans of the original story, it's a must-read book. What more can someone say? — *JGB*

The Gallery of His Dreams

by Kristine Kathryn Rusch
Axolotl Press, July 1991
80 pages, $10.00 (trade paperback)

Someone cynical might wonder if Rusch's work is as good as it's cracked up to be. After all, she's won a Campbell Award for best new writer, a World Fantasy Award for her editing at Pulphouse, and she's just become editor of *The Magazine of Fantasy and Science Fiction*. All this based on writing some short stories and editing a small-press anthology series. And this book in particular is being published by the company she works for, Pulphouse Publishing (Axolotl Press is a Pulphouse imprint).

Anyone who reads *The Gallery of His Dreams* will have no doubts, though: this is a major novella—"major" as in, it should win an award or two if there's any justice.

Here, Rusch follows Mathew B. Brady, the Civil War photographer, through his whole life. Periodically a mysterious woman appears to him, offering him a chance to give his work to future generations. When Brady finally agrees, he finds himself is various wars of the future: World War II, Vietnam, and conflicts yet to come. He uses his ancient equipment to photograph the devastation, marking for all times the futility and horrors of war.

It's a sad story, since we not only see Brady when he's summoned out of time, but we follow his whole life. Brady is obsessive about his work, and pretty much destroys his life and health to take his Civil War photographs. After the war, he's destitute; the government and his creditors take his precious photographs — and then seem to want to suppress them. Quite a blow for a man who wants the world to understand the horrors of war.

The Gallery of His Dreams has also appeared in *Isaac Asimov's Science Fiction Magazine* and will doubtless be appearing in one of more "Best of the Year" anthologies. Hunt it down in any form; it's well worth your time.

If you want to order it from the publisher, the address is: Pulphouse Publishing, P. O. Box 1227, Eugene, OR 97440. Collectors please note: Axolotl also publishes (more expensive) hardcover and leatherbound editions of their books; you might want to ask whether they're still available. — *JGB*

Ecce and Old Earth

by Jack Vance
Tor Books, August 1991
436 pages, $21.95 (hardcover)

Jack Vance has a penchant for series books. His latest, *Ecce and Old Earth*, is "Book Two of the Cadwal Chronicles," the sequel to *Araminta Station*.

The planet Cadwal is being kept as a preserve by the Naturalist Society on Earth. Unfortunately, the Naturalist Society has fallen on bad times; its few remaining members are old or senile or both. Due to embezzlement, its funds have been depleted; due to theft, most of its papers have been stolen.

On Cadwal, the humans who were originally allowed to live on the planet to look after it for the Naturalist Society have been fruitful and multiplied. We now have elite mainland families who run things, and the Yips, made up of every sort of outcast and scoundrel, who live mainly on an island and form a cheap source of labor. The Yips want citizenship and a place on the mainland. And there are those who would gain a great deal by eliminating the Cadwal Charter, under whose laws Cadwal is run.

Included in the papers stolen from the Naturalist Society, it turns out, is the Cadwal Charter. Whoever possesses the Charter can reregister Cadwal in his own name, if he chooses. Of course, a race is now on to find the missing Charter and either save—or destroy—Cadwal's current society.

I haven't read the first book in the series, *Araminta Station*, but found myself able to follow the plot of *Ecce and Old Earth* with no difficulty. Normally I would conclude that *Ecce and Old Earth* stands alone well, but after some thought I've decided it doesn't. There are certain archetypical "Vance characters" that populate many of Vance's works: the innocent but determined girl, the too-clever young hero, the overweight villain. If you're familiar with Vance's work, you immediately know who the good guys and bad guys will prove to be.

Ecce and Old Earth is certainly

worth reading; start with *Araminta Station*, though. Vance's worlds are clever constructions, and I'm certain I missed a lot of interesting details about Cadwal itself by skipping the first volume. — *JGB*

The Year's Best Science Fiction: Eighth Annual Collection
edited by Gardner Dozois
St. Martin's Press, July 1991
624 pages, $27.95 (hardcover) or $15.95 (trade paperback)

The eighth volume of the Dozois "Year's Best" is much in the vein of the previous seven: twenty-five stories and over a quarter million words of science fiction (and a couple that slosh over into fantasy). It also has a long summation of the field and an extensive list of honorable mentions worthy of diligent readers' attention.

As usual, this volume includes many of the nominees for the Hugo and Nebula Awards. It's easy to see why there aren't many other science fiction "Year's Bests" published in this country; by sheer volume, this book is a daunting competitor (thickness has its advantages). And yet I don't think the Dozois "Year's Best" is untouchable; there is always room for different viewpoints of the best of the year, and when there were three series going simultaneously, less than half of the contents of each tended to overlap.

Authors this time: James Patrick Kelly ("Mr. Boy"), Ursula K. LeGuin ("The Shobies' Story"), Greg Egan ("The Caress"), Charles Sheffield ("A Braver Thing"), Bruce Sterling ("We See Things Differently"), Kate Wilhelm ("And the Angels Sing"), Ian R. MacLeod ("Past Magic"), Terry Bisson ("Bears Discover Fire"), Lucius Shepard and Robert Frazier ("The All-Consuming"), Molly Gloss ("Personal Silence"), John Kessel ("Invaders"), Michael Moorcock ("The Cairene Purse"), Dafydd ab Hugh ("The Coon Rolled Down and Ruptured his Larinks, A Squeezed Novel by Mr. Skunk"), Ted Chiang ("Tower of Babylon"), Alexander Jablokov ("The Death Artist"), John Brunner ("The First Since Ancient Persia"), Nancy Kress ("Inertia"), Greg Egan again ("Learning To Be Me"), Connie Willis ("Cibola"), Jonathan Lethem ("Walking the Moons"), Ian McDonald ("Rainmaker Cometh"), Robert Silverberg ("Hot Sky"), Lewis Shiner ("White City"), Pat Murphy ("Love and Sex Among the Invertebrates"), and Joe Haldeman ("The Hemingway Hoax").

Where did the stories come from? Some interesting figures:

AMAZING® Stories: 1
Analog: 1
Asimov's: 10 (edited by Dozois)
Fantasy & Science Fiction: 1
Interzone: 1
New Pathways: 1
Omni: 2
Playboy: 2
Alien Sex (anthology): 1
Other Edens (anthology): 1
Semiotext[e] (anthology): 1
Universe (anthology): 1
Zenith (anthology): 1

Although *Asimov's* has more award-nominated stories than any other magazine or anthology this year, I find it hard to believe that every other professional magazine published only one or two stories deserving inclusion in a "Year's Best" anthology. Taking the above figures as representative, *Asimov's* averaged nearly one per issue.

While I can understand Dozois's enthusiasm for works he publishes, the disproportionate amount of material he takes from his own magazine is a problem with the anthology. Perhaps Dozois will look farther afield next time. His competitors certainly will. — *JGB*

Horses of Heaven
by Gillian Bradshaw
Doubleday, May 1991
448 pages, $20.00 (hardcover)

Gillian Bradshaw's new book, *Horses of Heaven,* is wonderful. Set in the second century B.C. in central Asia, it is a story of a land undergoing some significant societal changes. It is a few hundred years after Alexander the Great conquered the area, and the Greek influence is weakening. There is a growing threat from nomadic invaders, so the king, Mauakes, decides he must build an alliance with a former enemy, the Bactrians, for mutual protection. Not a popular move in many sectors of the nobility, the alliance is recognized by the Bactrians with a gift: some catapults, five war elephants, and a bride.

The bride, Heliokleia, turns out to be a young, very beautiful woman, and Mauakes finds himself not only married to her, but also in love with her. The two aren't well suited to each other, though, and Heliokleia finds herself unable to return the one thing Mauakes wants: love.

Heliokleia instead finds herself attracted to Itaz, the younger son of Mauakes. Itaz is fiercely loyal to his father, although they regularly disagree and Mauakes doesn't trust him. Mauakes, with the frustration and cynicism born of many years of fighting intrigue and plotting by everyone around him, has lost the ability to trust anyone, which leaves him bitter and paranoid.

What Bradshaw has done here is set up the classic situation of a woman married to one man and in love with another one who is permanently out of her reach. To her credit, though, Bradshaw completely ignores the standard formula for this plot and builds a fascinating, complex and original story around it. Heliokleia is firmly committed to making her marriage work as well as possible and supporting her husband by becoming the best queen she can be. Her every attempt to do so, however, makes Mauakes wary of her as he worries about her usurping or undermining his power. Itaz supports his father, but Mauakes refuses to believe that he is really loyal and thinks instead he's trying to gain influence for some faction. Even when good people do good things for the right reasons, bad things sometimes come out of it, and these three star-crossed people cycle around each other, spiraling down into the black hole of despair until it looks like everything is going to fall apart.

Horses of Heaven is a story about what happens when people—real people, not just the half-drawn characters that live in most books—try to

do their best in a situation where the best is never good enough.

Is everything resolved in the end? Do they all live happily ever after? Well . . . how often does that happen in real life? I found that I had to keep reminding myself that this was a novel and not a biography. This is a book I highly recommend. — *CVR*

The Phoenix Guards
by Steven Brust
Tor Books, September 1991
331 pages, $19.95 (hardcover)

Steven Brust's new book is set in the same universe as the others in his Vlad Taltos series (*Taltos, Jhereg* and others), but about 1,000 years before the birth of the assassin Vlad.

The story follows a young Draegarian by the name of Khaavren, who sets off to the city to join the Phoenix Guards, one of the troupes who guard the Emperor. Along the way, he meets three others with the same intent. Together they join the Guard and get involved in many adventures in the protection of the Orb.

If the plot sounds familiar, that's because *The Phoenix Guards* is not just a story of the history of Brust's Draegara, but it's also an homage of Alexander Dumas and based heavily on his book *The Three Musketeers*. Very close to the Dumas work both in style and attitude, I think some people are going to find it unreadable, especially if they pick up the book expecting another Vlad Taltos book. This book is related, but written in a much different, flowery and somewhat baroque style that is likely to turn some folks off.

Most people, though, should enjoy this book. Brust obviously knows the work of Dumas well and loves it, because he takes great pains to bring forward the richness of the writing and the irreverence of the characters that make Dumas a writer whose work has lasted through the years. At the same time, Brust is telling a story that is very much his own and fits within the history of Draegara.

It is the thirteenth day of the reign of Tortaalik I, who has just taken over control of the Orb; the previous Empress, Kaluma, abdicated after having beheaded a noble who argued with her about a piece of art. Tortaalik declares her a criminal and charges her with murder, and the four Guardsmen set off to track her down and bring her back to justice.

They must, however, deal with certain powerful people within the Court who wish Kaluma to stay alive and safe until a time when she can be used to further solidify their power base. They also need to find her first because Uttrik, son of the slain noble, is searching for her to avenge his father's death.

It's even more complicated than that: Khaavren, in a moment of passion with a woman he loves, promised to protect the Lady Kaluma from harm. This is a quandary—he's charged as a member of the Guard to arrest a woman whom he has sworn to protect from himself and his cohorts. Since honor is the critical aspect of being a gentleperson in this society and losing honor is worse than losing your life (so it seems, at least, from the number of duels fought to protect or avenge honor), apparently Khaavren is in an irreconcilable position.

Knowledge of the Dumas book will definitely enhance your enjoyment of *The Phoenix Guards*, but isn't necessary; the book stands on its own. You might, however, be tempted to go and read the original when you're done. — *CVR*

Grounded!
by Chris Claremont
Ace Books, August 1991
336 pages, $4.95 (paperback)

Grounded! is long-time comics writer Chris (X-Men) Claremont's second novel, a sequel to *FirstFlight*. In the first book, his protagonist, Nicole Shea, takes her first flight into space on what should be a short, straightforward training mission, but almost dies when she runs into space pirates who have taken over a mine in the asteroid belt, only to finally escape when she's rescued by some visiting aliens—thereby having the honor of being the first human to contact extraterrestrial intelligence.

Grounded! takes up where the earlier book left off. Nicole, after six months of therapy, is physically healed, but is grounded from spaceflight because nobody, Nicole included, is convinced she's mentally ready for space.

Instead, she's assigned to a team that is to work with the aliens in understanding and sharing technology with one another and see if it is possible to come up with a common shuttle design that both can use. Even though both civilizations have mastered space, it's an expensive proposition, so sharing development costs, if feasible, can make it more accessible to all.

Not everyone likes this, though. The alien Halyan't'a have insisted on dealing with a single, global, government, and many people don't want to give up their power to the United Nations, even for the possible benefits the Halyan't'a bring with them.

Someone makes an attempt on Nicole's life, but it fails. Another person mysteriously dies while staying in her house while Nicole is gone. I someone trying to get to the aliens through Nicole? Are they trying to destroy the chances of an alliance with them? Or is it a survivor of the pirates out for revenge?

Nicole has to stay alive and help make the alliance work while trying to find out who is trying to kill her and stop them before they succeed, and also resolve the lingering questions that may keep her from flying in space ever again.

If it sounds like Claremont has wedged a lot into this book, you're right. *Grounded!* is a carefully plotted, complex book. Technically, his writing is fine, but it's his plotting that really makes his books shine. *Grounded!* is a couple of evenings of solid, enjoyable SF action/adventure entertainment that I can heartily recommend. — *CVR* ✦

Looking Forward:

The Summer Queen

by Joan D. Vinge

Coming in November 1991 from Warner Books

Introduction by Bill Faucett

This book is the latest in a series that began with *Snow Queen* and continued with *World's End*. As in the earlier novels, the reader is treated to Joan Vinge's vision of a distinctive and sophisticated future. In *World's End* the heroes encountered a lake that has been contaminated by a most unusual plasma. This high-energy "gas" endows the lake with an alien intelligence. It also makes the waters of the lake capable of linking any human's mind to itself, normally with disastrous results for the human involved. But the isolated intelligence of the lake *needs* these contacts.

The following excerpt tells part of the story of an expedition whose purpose is to test a vaccine that might work against this "infection." The members of the expedition have already been through several struggles, against both nature and bureaucracy. Now they approach the lake, and the ruins left by a human community that once had a symbiotic relationship with the alien intelligence.

—

"Where were you?" Reede said, more abruptly than he meant to.

"Just . . . looking." Ananke shrugged, looking guilty now. "I wanted to see Fire Lake. . . ." His eyes broke away from Reede's gaze and focused on his feet, which were scuffing gravel. "Did you need me for something, bo—Dr. Kullervo?"

"No." Reede tried to make his own expression more pleasant; every time he looked hard at Ananke, the kid

Cover art by Michael Whelan

wilted like a plant. Dressed in a loose shirt and baggy shorts, with his hair tied back in a ponytail, he looked almost fragile, in spite of the athlete's muscles that showed along his bare arms and legs. Ananke couldn't be more than three or four years younger than he was himself; but sometimes Reede felt as if the difference in their ages was measured in centuries. "Gundhalinu said not to get too far from camp. It's . . . dangerous." He hadn't tried to explain. World's End's reputation was enough.

"Yes, Doctor, I know." Ananke nodded earnestly, patting the quoil. The quoil burbled contentment, apparently undisturbed by anything as long as it was attached to its owner. "Commander Gundhalinu went with me; he said it was all right."

"Where is he?"

"He's still looking at the Lake."

Reede glanced away down the canyon, and back. "Doesn't that thing ever walk?" he said, gesturing at the quoil, wondering why they didn't both have heat prostration.

Ananke shrugged again, the quoil riding the motion easily. "They like to sit," he said.

Reede smiled in spite of himself, as Niburu returned with an armload of supplies. He left them standing together and walked off between the domes.

He followed the curving canyon in the direction he knew led toward Fire Lake. As he rounded the first bend, shutting away the sight and sound of the camp behind him, he had the sudden, unnerving feeling that if he turned back he would find it was no longer there, and he was all alone. . . . He pushed on resolutely, frowning, listening to the substantial crunch of sand and gravel under his boots, feeling the heat, touching the crumbling mud of the canyon wall as he walked.

Up ahead a flicker of movement caught his eye on the stark, stony ground. He caught up with the thing that floundered there; stared down at it in silent fascination. It was brown, or green, or red, or all of those, and it resembled a fish more than anything else he could imagine, but it was crawling, after a fashion, on things that were more than fins but less than legs. He watched the fish-out-of-water struggle on up the canyon, oblivious to his presence in its grotesque, single-minded urge toward something that was probably forever incomprehensible even to it.

Reede stood wondering what in the name of a thousand gods it was searching for, tortuously dragging itself millimeter by millimeter over the heated stones. He followed its trajectory with his eyes; saw up ahead in the protected curve of the wash another of the moss-green, ephemeral pools that dotted the canyon bottom. A scattering of ferns waved like feathers at its edge, beckoning with their motion in the hot, faint wind. Reede glanced back the way the thing had come, and saw in the distance another pool, reduced now to barely more than a mudhole. *Escape.* He looked again at the fish-thing, in agonizing, floundering progress toward something better. It didn't know that the pool it was struggling toward would be a mudhole too in a few more days; that all its struggles were in vain. He could see that, but the fish-thing couldn't. When that pool dried up, it would struggle on again, until it found another pool, a little deeper, or the floods came, or it died. . . . *Survival.* Maybe it was all meaningless, but that thing would go on futilely struggling to survive. . . . He watched it, feeling wonder, and grudging admiration, and disgust.

And then he kicked it, hard. It went skidding over the gravel for nearly a meter and a half in the firection of the pool. It flopped silently, desperately on its side, its fins waving like flags; righted itself at last and began to crawl forward again toward the pool, as though nothing had happened. Reede turned away from it and strode on down the wash, clenching and unclenching his hands.

He rounded another bend in the canyon, and stopped dead, staring. Fire Lake lay before him, although he had been certain that he could not have come this far already. Its presence was a physical blow against his senses; not simply heat and light, but sensations that his brain could not even begin to quantify. Its presence poured into his mind through every available receptor, eyes, ears, nose, skin—

"You feel it."

It took him a moment to realize that the words, the voice, were not a manifestation of the Lake, or an hallucination; that the shadow-figure suddenly standing before him on the congealed-stone surface of the beach was really Gundhalinu.

Reede blinked, filling in the detail of Gundhalinu's face with dazzled eyes. "Yes . . ." he said, his own voice coagulating in his throat. He was not tempted to ask whether the Lake affected everyone like this; somehow he knew that it did not.

"What do you see?" Gundhalinu asked eagerly. "What do you hear?"

Surprised at the question, and at Gundhalinu's impatience, Reede said thickly, "Light. Noise . . . a kind of white noise. I can't describe it." He shook his head. "As if . . . as if, if I only had *something,* it could tell me, and I'd know . . ." He wanted to spit out whatever was wrong with his mouth, shake something loose that had hold of his brain. "Gods, that sounds like a lot of shit—" he said angrily. "I don't know what I'm trying to say. What do you see?"

"Ghosts," Gundhalinu said, sounding vaguely disappointed, looking out across the Lake again. "The past and the future, flowing in and out of existence; metaspace conduits opening and closing."

Reede laughed uncertainly. "You have a better imagination than I do."

"It isn't my imagination . . . it's the sibyl virus." Gundhalinu focused on Reede's face again with what seemed to be an effort. "It lets the Lake in . . . it's like having a thousand madmen screaming inside my skull, constantly. It makes it very . . . difficult to be here, and function normally. The adhani disciplines help me; I've learned more biofeedback control techniques since I entered the higher levels of Survey." He ran his hands down the rumpled cloth of his loose pantslegs in a futile neatening gesture.

Reede grimaced. "I don't think I could take that," he muttered. *Not on top of the rest . . . dreams, broken mirrors, the emptiness, the void . . .*

Gundhalinu was still watching him with a strange intentness. "You sense the phenomena more than anyone I've met, except another sibyl. But only with a part of your mind. Another part of you hears nothing; that's what protects you—"

Reede shoved him hard in the chest, knocking him down. "Goddammit!" The pocked, convoluted surface of the shore around Gundhalinu suddenly seemed to be made up of the screaming mouths and mindless eyes of a million faces, souls trapped in an unimaginable hell-on-earth.

Gundhalinu got slowly to his feet. He shook his head like someone who was just waking up, and looked at Reede blankly. "What the hell was that about?" he asked.

Reede forced himself to stop staring at the ground, and met Gundhalinu's querulous gaze. "Don't talk to me like that!"

"Like what?"

"Like you think you know how I feel."

Gundhalinu looked away toward the lake, and back at him. "Gods, I hate this—!" His voice shook. He rubbed his face, murmuring something inaudible. He said aloud, more evenly, "I'm sorry. It seemed to make sense when I said it. . . . This will get better, as I adjust to it. It's always worst at the start."

Reede made a face, as an unexpected emotion struggled inside him like a fish-thing on burning rock. "I'm not used to being around somebody who seems to be crazier than I am." He began to turn away, wanting to put distance between himself and the Lake, himself and Gundhalinu, himself and the silent, screaming faces of the shore.

"Reede." Gundhalinu gave him a bleak, painful smile as he grudgingly turned back. "Before you go, would you help me find out just how crazy I really am? Do you see an island out there?" He pointed toward the Lake, turned with the motion, as if a kind of yearning drew him.

Reede followed the line of his gesture, squinting into the glare that obliterated everything at first, even the sky. He shielded his eyes, blinking until he could begin to see clearly—see the stark, solid form that rose like the back of some primordial beast from the middle of the molten sea. "Yes," he said at last, his voice as husky as if it had dried up in his throat, as if he had been standing there, listening with his nerve-endings, for days. "Yes, something's out there. Looks like an island, I guess."

Gundhalinu made a sound that was a choked-off cry of triumph. "It's come back—! It knows, the Lake knows that this time we've got the answer." He looked at Reede again, his eyes shining; caught Reede's arms as he tried to pull away. "Have you heard of Sanctuary?"

Reede started. "You said it was a place in the middle of the Lake, full of lunatics and 'jacks. . . . Is that where it is?" He looked into the shimmering brightness.

"Where it used to be," Gundhalinu murmured, his own gaze drifting toward the Lake again. "Where I found my brothers, and Song. They came after us when we tried to escape—and the Lake swallowed them all, this town, the entire island. No one's seen it since . . . until now."

Reede half frowned in disbelief. "Gods! You're telling me it just disappeared? And now it's just come back again? Everything?"

Gundhalinu nodded. His fists tightened and he grinned, a grin of desperate hope. "The island has. I don't think we'll find the inhabitants." His voice hardened. "They'd have been swarming on us like deathwatch beetles by now. . . . The question is, what else came back?"

"What do you mean?" Reede asked, caught by Gundhalinu's sudden eagerness.

"I mean the ship the stardrive plasma came from, that created Fire Lake. If the Lake actually knows we have an answer, then it could . . . could . . ." His gaze drifted down to the ground beneath his feet, the screaming faces of the damned. "It must have driven off or killed the people who built Sanctuary. But it's never forgotten them. It dreams about them constantly. It needs human contact, human help . . . it's been waiting for us to come again and end its madness, its randomness—"

"Yeah, right," Reede said, jerking free from Gundhalinu's hold. "Well, we're here to give it what it wants. Then you'll both feel better. Let's go back to camp."

"We have to go out to the island tomorrow," Gundhalinu said, as if he wasn't listening. But his gaze was clear and rational again.

"Why?" Reede asked, still leery.

"That's where the starship is."

Reede's eyes widened. "You mean the actual Old Empire ship, intact?"

"Parts of it, at least." Gundhalinu nodded, and his grin came back. "Imagine, if the drive unit is still there! Having an actual model to work from would give us a tremendous leg up in creating new ones of our own."

Reede felt a surge of excitement that was like some perverse desire. He shrugged uncomfortably, uncertain if the feeling even belonged to him. "We'd better find out if the vaccine works on the real Lake, first," he said roughly. "Let's get out of here." He pulled at Gundhalinu's arm. "Come on—"

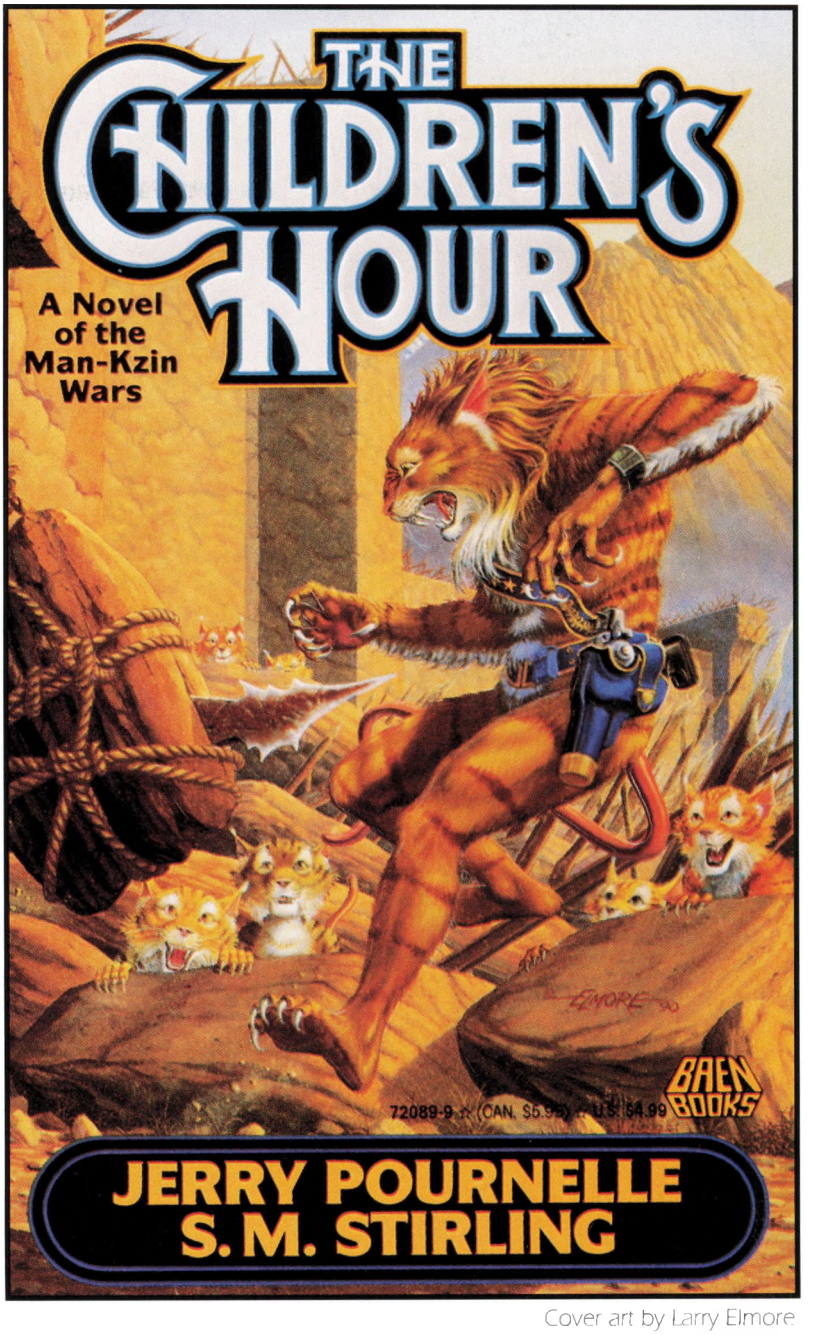
Gundhalinu nodded, turning away from the Lake at last in a motion that seemed to take all his strength. They crossed the beach and entered the canyon mouth, hiking back along the sandy wash. Reede saw no sign of the fish-thing. He wondered whether he had ever really seen it at all. ✦

Looking Forward:

The Children's Hour

by Jerry Pournelle and S. M. Stirling

Coming in November 1991 from Baen Books



Cover art by Larry Elmore

Introduction by Bill Fawcett

This book is a novel set in the exciting and unusual world of Larry Niven's known space. Several of SF's top authors have created stories set in this universe, and *The Children's Hour* is the latest product of the imaginations of Jerry Pournelle and S. M. Stirling. The book is a compilation of some of the stories that have appeared in the popular *Man-Kzin War* anthologies, and is a must-read for anyone who enjoys reading about the military or about cats —in this case, *big* cats.

Early in humankind's venture into space, travelers encounter the kzin, catlike aliens that are very warlike. Human beings, after three centuries of peace, are forced to relearn the art of war.

A major cause of the threat to humankind is the brilliant kzin governor. To counter this threat, the humans mount two expeditions. One is a sneak attack at a kzin-dominated human world to kill the governor; the other is a risky intrusion into kzin-controlled space to recover a powerful alien artifact. This excerpt chronicles the beginnings of both missions.

—

"Prepare for separation," the computer said. The upper field of the *Catskinner*'s screen was a crawling slow-motion curve of orange and yellow and darker spots; the battle schematic ahowed the last few slugs dropping away from the *Yamamoto*, using the gravity of the sun to whip around and curve out toward targets in a different quarter of the ecliptic plane. More than a few were deliberately misaimed, headed for catastrophic destruction in Alpha Centauri's photosphere as camouflage.

It can't be getting hotter, he thought.

"Gottdamn, it's hot," Ingrid said. "I'm swine-sweating."

Thanks, he thought, refraining from speak-

ing aloud with a savage effort. "Purely psychosomatic," he grated.

"There's one thing I regret," Ingrid continued.

"What's that?'

"That we're not going to be able to see what happens when the *Catskinner* and those slugs make a high-Tau transit of the sun's outer envelope," she said.

Jonah felt a smile crease the rigid sweat-slick muscles of his face. The consequences had been extrapolated, but only roughly. At the very least, there would be solar-flare effects like nothing this system had ever witnessed before, enough to foul up every receptor pointed this way. "It would be interesting, at that."

"Prepare for separation," the computer continued. "Five seconds and counting."

One. Ingrid had crossed herself just before the field went on. Astonishing. There were worse people to be crammed into a Dart with for a month, even among the more interesting half of the human race.

Two. They were probably going to be closer to an active star than any other human beings had ever been and survived to tell the tale. Provided they survived, of course.

Three. His grandparents had considered emigrating to the Wunderland system; he remembered them complaining about how the Belt had been then, everything regulated and taxed to death, and psychists hovering to resanitize your mind as soon as you came in from a prospecting trip. If they'd done it, *he* might have ended up as a conscript technician with the Fourth Fleet.

Four, Or a guerrilla; the prisoners had mentioned activity by "feral humans." Jonah bared his teeth in an expression a kzin would have had no trouble at all understanding. *I intend to remain very feral indeed. The kzin may have done us a favor; we were well on the way to turning ourselves into sheep when they arrived. If I'm going to be a monkey, I'll be a big, mean baboon, by choice.*

Five. Ingrid was right, it was a pity they wouldn't be able to see—

-discontinuity-

"Greow-Captain, there is an anomaly in the last projectile!"

"They are all anomalies, Sensor Operator!" The commander did not move his eyes from the schematic before his face, but his tone held conviction that the humans had used irritatingly nonstandard weapons solely to annoy and humiliate him. Behind his back, the other two kzin exchanged glances and moved expressive ears.

The Slasher-class armed scout held three crewkzin in its delta-shaped control chamber, the commander forward and the Sensor and Weapons Operators behind him to either side; three small screens instead of the single larger divisible one a human boat of the same size would have had, and many more manually activated controls. Kzin had broader-range senses than humans, faster reflexes, and they trusted cybernetic systems rather less. They also had gravity control almost from the beginning of spaceflight; a failure serious enough to immobilize the crew usually destroyed the vessel.

"Simply tell me," the kzin commander said, "if our particle-beam is driving it down." The cooling system was whining audibly as it pumped energy into its central tank of degenerate matter, and still the cabin was furnace hot and dry, full of the wild odors of fear and blood that the habitation system poured out in combat conditions. The ship shuddered and banged as it plunged in a curve that was not quite suicidally close to the outer envelope of the sun.

Before Greow-Captain a stepped-down image showed the darkened curve of the gas envelope, and the gouting coriolis-driven plumes as the human ship's projectiles ploughed their way through plasma. Shocks of discharge arched between them as they drew away from the kzin craft above, away from the beams that sought to tumble them down into denser layers where even their velocity would not protect them. Or at least throw them enough off course that they would recede harmlessly into interstellar space. The light from the holoscreen crawled in iridescent streamers across the flared scarlet synthetic of the kzin's helmet and the huge lambent eyes; the whole corona of Alpha Centauri was writhing, flowers of nuclear fire, a thunder of forces beyond the understanding of human- or kzinkind.

The two Operators were uneasily conscious that Greow-Captain felt neither awe nor the slightest hint of fear. Not because he was more than normally courageous for a young male kzin, but because he was utterly indifferent to everything but how this would look on his record. Another glance went between them; younger sons of nobles were notoriously anxious to earn full Names at record ages, and Greow-Captain had complained long and bitterly when their squadron was not assigned to the Fourth Fleet. He was so intent on looking good that operational efficiency might suffer.

They knew better than to complain openly, of course. Whatever the state of his wits, there was *nothing* wrong with Greow-Captain's reflexes, and he already had an imposing collection of kzin-ear dueling trophies.

"Greow-Captain, the anomaly is greater than a variance in reflectivity," the Sensor Operator yowled. Half his instruments were useless in the flux of energetic particles that were sheeting off the *Slasher*'s screens. He *hoped* they were being deflected; as a lowly Sensor Operator he had not had a chance to breed. Not so much as a sniff of kzinrret fur since they carried him mewling from the teats of his mother to the training creche. "The projectile is not absorbing the quanta of our beam as the previous one did, nor is its surface ablating. And its trajectory is incompatible with the shape of the others; this is larger, less dense, and moving . . ."—a pause of less than a second to query the computer—". . . moving as if its outer shell were absolutely frictionless and reflective, Greow-Captain. Should this not be reported?"

Reporting would mean retreat, out to where a message-maser could punch through the chaotic broad-spectrum noise of an injured star's bellow.

"Do my Heroes refuse to follow into danger?" Greow-Captain snarled.

"Lead us, Greow-Captain!" Put that way, they had no choice; which was why a sensible officer would never have put it that way. Both Operators silently cursed the better diet and personal-combat training available to offspring of a noble's household. It had been a *long* time since kzin had met an enemy capable of exercising greater selective pressure than their own social system.

"Weapons Operator, shift your aim to the region of compressed gasses directly ahead of our target, all energy weapons. I am taking us down and accelerating past redline." With a little luck, he could ignite the superheated and compressed monatomic hydrogen directly ahead of the projectile, and let the multimegaton explosion flip it up or down off the ballistic trajectory the humans had launched it on.

Muffled howls and spitting sounds came from the workstations behind him; the thin black lips wrinkled back more fully from his fangs, and slender lines of saliva drooled down past the open neckring of his suit. *Warren-dwellers*, he thought, as the *Slasher* lurched and swooped.

His hands darted over the controls, prompting the machinery that was throwing it about at hundreds of accelerations. *Vatach hunters*. The little quasi-rodents were all lower-caste kzin could get in the way of live meat. Although the anomaly was interesting, and he would report noticing it to Khurut-SquadronCaptain. *I will show them how a true hunter—*

The input from the kzin boat's weapons was barely a fraction of the kinetic energy the *Catskinner* was shedding into the gasses that slowed it, but that was just enough. Enough to set off chain-reaction fusion in a sizable volume around the invulnerably protected human vessel. The kzin craft was far enough away for the wave-front to arrive before the killing blow:

"—shield overload, loss of directional *hhnrrreaw*—"

The Sensor Operator shrieked and burned as induction-arcs crashed through his position. Weapons Operator was screaming the hiss of a nursing kitten as his claws slashed at the useless controls.

Greow-Captain's last fractional second was spent in a cry as well, but his was of pure rage. The *Slasher*'s fusion-bottle destabilized at almost the same nanosecond as her shields went down and the gravity control vanished; an imperceptible instant later only a mass-spectroscope could have told the location as atoms of carbon and iron scattered through the hot plasma of the inner solar wind.

-discontinuity-

"Shit," Jonah said, with quiet conviction. "Report. *And stabilize that view.*" The streaking pinwheel in the exterior-view screen slowed and halted, but the control surface beside it continued to show the *Catskinner* twirling end-over-end at a rate that would have pasted them both as a thin reddish film over the interior without the compensation fields.

The screen split down the middle as Ingrid began establishing their possible paths.

"We are," the computer said, "traveling at twice our velocity at switchoff, and on a path twenty-five degrees further to the solar north." A pause. "We are still, you will note, in the plane of the ecliptic."

"Thank Finagle for small favors," Jonah muttered, working his hands in the control gloves. The *Catskinner* was running on her accumulators, the fusion reactor and its so-detectable neutrino flux shut down.

"Jonah," Ingrid said. "Take a look." A corner of the screen lit, showing the surface of the sun and a gigantic pillar of flare reaching out in their wake like the tongue of a hungry fire-elemental. "The pussies are burning up the communications spectra, yowling about losing scoutboats. They had them down low and dirty, trying to throw the slugs that went into the photosphere with us off course."

"Lovely," the man muttered. *So much for quietly matching velocities with Wunderland while the commnet is still down.* To the computer: "What's ahead of us?"

"For approximately twenty-three point six lightyears, nothing."

"What do you mean, nothing?"

"Hard vacuum, micrometeorites, interstellar dust, possible spacecraft, bodies too small or nonradiating to be detected from our position, superstrings, shadowmatter—"

"Shut up!" he snarled. "Can we brake?"

"Yes. Unfortunately, this will require several hours of thrust and exhaust our onboard fuel reserves."

"And put up a fucking great sign, 'Hurrah, we're back' for every pussy in the system," he grated. Ingrid touched him on the arm.

"Wait, I have an idea . . . is there anything substantial in our way, that we could reach with less of a burn?"

"Several asteroids, Lieutenant Raines. Uninhabited."

"What's the status of our stasis-controller?"

A pause. "Still . . . I must confess, I am surprised." The computer sounded surprised that it could be. "Still functional, Lieutenant Raines."

Jonah winced. "Are you thinking what I think you're thinking?" he said plaintively. "*Another* collision?"

Ingrid shrugged. "Right now, it'll be less noticeable than a long burn. Computer, will it work?"

"Ninety-seven percent chance of achieving a stable Swarm orbit. The risk of emitting infrared and visible-light signals is unquantifiable. The field switch will *probably* continue to function, Lieutenant Raines."

"It should, it's covered in neutronium." She turned her head to Jonah. "Well?"

He sighed. "Offhand, I can't think of a better solution. When you can't think of a better solution than a high-speed collision with a rock, something's wrong with your thinking, but I can't think of what would be better to think . . . What do *you* think?"

That an unshielded collision with a rock might be better than another month imprisoned with your sense of humor . . ." ✦

Courting Chaos

Stephen L. Gillett

> Given . . . an intelligence which could comprehend all the forces by which nature is animated . . . it would embrace in the same formula the movements of the greatest bodies . . . and those of the lightest atom; for it, nothing would be uncertain and the future, as the past, would be present to its eyes.
> — Pierre Simon de Laplace, 1796

Laplace's idea was merely common sense to generations of physicists, and even now, some people outside physics—like the social scientists who preach social determinism—still buy it. But it's wrong, and it's wrong due to deterministic chaos.

"Deterministic chaos"? That sounds oxymoronic, even Orwellian, a slogan like "Freedom is slavery" or "War is peace."

But deterministic chaos is a trendy topic in mathematics and the applied sciences. Physics, geophysics, climatology, fluid dynamics, celestial mechanics, mathematical ecology, even the social sciences: the same mathematical phenomenon is showing up in these fields and many others.

How does "chaos" come from determinism? In this way: the mathematical equations describing a system—the weather, say—are perfectly deterministic. If you enter *exactly* the same values of atmospheric pressure, temperature, wind speed, and so forth into the equations, you will always get the same answer.

But in the real world, your values are never exact. Measurements always have experimental error. And for something like the weather, we can't measure everywhere, either. Inevitably the measurements are spotty, with a few here, a few there, and big gaps in between. And last, even calculated numbers aren't perfect. Any computer calculates a result to only a finite number of decimal places, but in general a numerical result is an infinite decimal. Even a simple fraction like $1/3$ can't be expressed as a finite decimal; it's of course 0.3333 . . . . So, no real calculation is free from ordinary roundoff error.

Now, with well-behaved, nonchaotic systems, this all doesn't matter too much. If you're just a bit off in your measurements, your calculated results will also be just a bit off, so that results predicting the behavior of the system even far in the future are only a bit off. If you have only two objects, for example, you can predict how they'll orbit under the influence of their mutual gravitational attraction indefinitely. And if you're just a little bit off in how you specified the initial orbit, the resulting orbit will be just a little bit off, too; and it will *always* be just a little bit off. It will never get any worse.

With chaotic systems this just doesn't happen. Any initial error builds up exponentially, until before long the calculated predictions have no resemblance to the real world. You'd have to know your measurements to literally infinite precision to calculate how the system will behave indefinitely.

This "extreme sensitivity to initial conditions" is sometimes called the "butterfly effect," a name conferred by frustrated atmospheric scientists. The idea, which is only slightly exaggerated, is that the tiny air perturbations from a butterfly flapping its wings would eventually make nonsense of even the most sophisticated weather forecast, however detailed and comprehensive the calculations it was based on.

This is "deterministic chaos," and its recognition in many well-characterized mathematical systems is having major reprecussions all through the sciences. For one thing, it means that we will *never* have exact, long-term weather forecasts. As I'll discuss, that doesn't mean we won't be able to make any useful long-term statements about the weather, but it does mean that they will be general statements. Details like "There will be an intense thunderstorm over my house at 2:14 P.M. on July 14, 2003" are just not in the cards.

Other such mathematical "systems," besides the weather, include turbulent flow in fluids (e.g., water in rivers, smoke out of chimneys), the waves on the ocean, the number of predators versus number of prey animals in an ecosystem, the number of participants in a riot—lots of everyday phenomena, in lots of different fields. Many are well-characterized mathematically—some have been characterized for centuries, in fact—and if they involve physics, it's well-known physics, things like heat

flow or Newtonian mechanics or classical thermodynamics.

Even physics as long-known as Newton's Law of Gravitation can lead to chaotic behavior. Above, I used the classic "two-body" orbit problem as an example of a system that we can predict forever. But add a third body to the first two, and you get a classic celestial-mechanics problem, the "three-body problem," that's still essentially unsolved in its most general form. The reason it remains unsolved is that it's generally chaotic.

(Of course, the Solar System itself contains more than two bodies, and sure enough, we're finding more and more examples of chaos in Solar System motions. The orbit of Pluto* and the orbits of many asteroids and small, distant satellites are chaotic, in that the orbit is not predictable in detail indefinitely into the future. Initial errors in specifying these bodies' positions grow, and grow, and grow, until finally the orbit is very different from the one you predicted. The tumbling of Saturn's satellite Hyperion in its orbit is another example that you've probably already read about; the orientation of this satellite's rotation axis is changing chaotically.)

What are the characteristics of a chaotic system? Well, to first forestall a misconception: mathematical chaos has nothing to do with quantum mechanics! You've probably heard of "quantum uncertainty" and Werner Heisenberg's Uncertainty Principle. Those are completely unrelated concepts. Deterministic chaos is much more immediate. It flows directly from mathematical forumlations that have been known for centuries, such as the mathematics of most of classical physics.

Mathematical systems capable of showing chaos all have one thing in common; they're all "non-linear" systems. A "linear" system has several characteristics: if you multiply a solution to the system by a constant, it's still a solution, and if you have two or more solutions, their sum is also a solution. (The name comes from the behavior of the equations describing the graph of a straight line.)

A non-linear system doesn't act this way. There *is* no general relationship among solutions; they can be scrambled together as products, or powers, or logarithms, or any other complicated mathematical relation. And, as you might figure from Murphy's Law, virtually anything of interest you'd want to describe mathematically is actually non-linear.

So if everything is really non-linear, why was the significance of chaos missed so long? For two reasons. First, lots of things are *almost* linear, so you can approximate them with a linear system, and second, linear systems are very easy to solve mathematically. In fact, over the years mathematicians have devised general techniques for solving *any* linear system, a deadly arsenal of weapons like "separation of variables" and "Fourier expansions" and "Laplace transforms" and so on. By contrast, non-linear systems are not only exceedingly difficult to solve in general, but there are no general rules for doing so. Each non-linear system is a law unto itself.

This "linearization" works pretty well in lots of cases, too, because even systems that can show chaotic behavior do not show it everywhere. One example from high-school physics is the swing of a pendulum. A pendulum's swing is *almost* "simple harmonic motion," which is described by a linear differential equation. And sure enough, non-linear or not, an ordinary pendulum's swing is non-chaotic. (Even slightly more complex arrangements of ordinary pendulums can show chaotic motions, though—which is hardly surprising because, after all, the underlying mathematics is non-linear.)

Anyway, so it made sense that physicists, engineers, and other people using mathematical tools spent most of their time working on linear systems, particularly in pre-computer days. They could get useful results done that way. In fact, my undergrad course on differential equations for scientists and engineers, which I took years ago, came right out and said we would deal only with linear equations because you could solve them. In any event, the few non-linear systems that had been solved, like the two-body problem, were well-behaved, so most people didn't figure that the *unsolved* non-linear problems were fundamentally different.

But the recognition of chaos has, not surprisingly, ignited new interest in non-linear systems in all their awesome and gorgeous generality. The questions have changed, however: It's now not "How can we solve this system of equations?"—because even if you can solve it, the solution isn't helpful. It's "What can we say in general about the solutions?" For example, what can we say about *average* weather conditions? Chaos or no, it doesn't seem reasonable that you'd *ever* have a snowstorm in Miami in August. Such questions are about "boundedness," in math-speak; in other words, although we can't predict the details of the weather over time, can we say there are definite limits to what the weather can do?

Indeed we sometimes can say such general statements. There is, after all, order in chaos.

To give you the flavor of how this is done, I have to talk about "phase space" for a minute. We're all familiar with a physical space of three dimensions, which we can describe with coordinates such as north, east, and up. In a "phase" space, we're using coordinates that represent not just space but also momentum, and generally there are more than three of them. Even so, the geometry is analogous. (They're actually "generalized" coordinates and momenta, but the difference is not important here.)

In physical space, we can also talk about a "path," which is simply a set of points like a straight line or some sort of curve, and you can describe that path with an equation. Analogously, we can talk about a "path" in phase space, which is simply the curve traced out by the position and momentum values the system has at each point.

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* Actually, predictions of Pluto's orbit start to diverge significantly only after tens of millions of years. So there's no problem predicting its position over human timescales. But since the Solar System is *much* older than that, Pluto's motions *are* unpredictable over the life of the System.

Now, when we look at the behavior of some system over time, we find it will eventually end up on some path in phase space. This path is called an "attractor," because it's as though it eventually "attracts" the system. One example of an attractor is a point, which is the attractor for all systems with friction. Eventually they all slow down and stop, which means they all land at a point in phase space: the momentum is zero, and the space coordinates of the point are simply where it happened to stop.

Classic, non-chaotic systems have simple attractors like a point or closed loops. It turns out that chaotic systems have attractors too, but they're incredibly intricate curves that never repeat themselves exactly, and that (probably inevitably) have been named "strange attractors." Nonetheless, however intricate they are, strange attractors are specific curves. They contain some points, and don't contain others.

So yes, we can already say the chaotic system has limits. There are places it cannot go, and things it cannot do; or in other words, there are points in phase space it cannot reach. The system is bounded. Hence, although we can't predict weather exactly, we should be able predict *average* weather, and yes, we should be able to say that you won't get August snowstorms in Miami.

But it's even better than that. It turns out there are a limited number of strange attractors, so that many different non-linear systems, when looked at in this way, have essentially the same chaotic behavior. Suddenly, results in, say, mathematical ecology are relevant to the social sciences (a real example, by the way).

Chaos also has changed how we look at physical problems. On just a pragmatic level, for example, you have to check your mathematical description to see whether—and where—it acts chaotically. One "brute force" method, useful in complex systems where you're doing everything by computer anyway, is to calculate *several* predictions, not just one. First calculate with your actual data, and then calculate again with slightly different values. If all the calculations give about the same answer, you're probably okay; but if they diverge widely, watch out! Don't take *any* of them seriously. This is done with long-term weather forecasts nowadays, for example.

More subtly, deterministic chaos has led to a different way of approaching the problems, a so-called "paradigm shift." In many cases we simply were asking the wrong questions beforehand.

For example, one of the mathematical phenomena that starts happening when your system is in or near a chaotic regime is that cycles start showing up. Such cycles occur in predator-prey relationships, for example. From year to year the number of coyotes versus the number of rabbits fluctuates, commonly drastically and apparently almost periodically, and for years ecologists worried about what could be causing these almost-periodic fluctuations. Was it drought? Disease? Migration patterns? It turned out, though, that when you mathematically model such a predator-prey system it is chaotic, and most if not all of the cycles result from nothing more than the very mathematics of the system. They reflect nothing in the physical environment of the coyotes or the rabbits themselves.

The social sciences provide a similar example. Large urban riots, for example, show nearly cyclic fluctuations in the number of participants, and researchers spent years trying to explain the "cycles." Again, they turned out to result from the mathematics of chaos.

Chaos in celestial dynamics also refocuses some classic problems about the Solar System. For example, is it stable? Or even if it is generally stable, are various individual planetary orbits stable? Is there a chance that (say) Pluto will get flung out of the system someday?

Obviously, with our chaotic perspective, we can't tell if it's stable just by calculating the behavior of the system into the future, even with the most detailed number-crunching imaginable, although we can use such computation to tell if—and where—there's chaotic behavior. But we can try to look at the celestial-mechanics problems in phase space to see if we can find the ultimate bounds on the motions. Even though, say, we can't predict Pluto's orbit a billion years from now, we should be able to tell whether Pluto will remain in orbit indefinitely, or whether it will get slung out of the system someday. As far as I know, we still don't know—but I'm sure it's being worked on.

Another example, from my own field, is the explanation for geomagnetic reversals. Everyone knows that the Earth has a magnetic field whose poles are more or less aligned with the Earth's rotational axis. That's how compasses work, of course. Every now and then the magnetic poles reverse—that is, they change their polarity. The north magnetic pole becomes south and vice versa. Of course, the Earth doesn't turn over: what happens is that the magnetic field occasionally dies away completely for a few thousand years, and when it builds back up again it can just as easily have opposite polarity.

There's lots of hypothesizing in the geophysical literature about the "causes" of geomagnetic reversals. Geophysicists have speculated that maybe reversals are triggered by giant bolide impacts, or maybe by interactions between the Earth's iron core and its overlying rocky mantle, or maybe by continental drift, or maybe by giant outbursts of volcanic activity on the surface.

But as it happens, they're probably just intrinsic in the physical system. Although the source of the magnetic field isn't known in detail, it *is* known to result from a highly nonlinear system, and it does appear that the magnetic field should be able to have either polarity. So magnetic reversals may well be a chaotic phenomenon, and if so, you'd expect them to happen occasionally and sporadically. We no more need a particular explanation for a particular reversal than we need a special explanation for why a thunderstorm happened last Thursday.

Deterministic chaos has quite a few other implications, too. Two examples I've already mentioned are the downfall of exact weather forecasting, and the impossibility of exact ephemerides for chaotic orbits.

Another is that an exact "Science

of Man" is not possible. If we can't even predict the details of the weather, how much less the detailed interactions of human beings! The "psychohistory" in Asimov's *Foundation* series is almost certainly impossible, although at least Asimov was somewhat realistic in that he emphasized that his psychohistory would have to be statistical. In any case, the extreme determinism in Vonnegut's *Slaughterhouse Five*, or *Venus on the Half-Shell* by "Kilgore Trout" is utter nonsense—but since the latter book was a parody, that presumably was the author's point. (At the end of *Venus on the Half-Shell*, the protagonist finds his very appearance at that exact time has been predicted, ever since the beginning of the Universe, by the near-omniscient computers of a superintelligent cockroach species.)

Deterministic chaos also clobbers any notion of a detailed social determinism—although many social scientists are lagging their physical-science colleagues (once again!) by not seeing the implications of chaos for such hypotheses as behaviorism and economic determinism. As one scientist put it, not only can't you make social science like physics, even physics isn't like physics any more! (Of course, sophisticated observers of the human scene always have had misgivings about the "scientific" pretensions of would-be social engineers —for example, William H. Whyte's deft dissection in *The Organization Man* more than 30 years ago.)

The patterns of voter loyalty and riot intensity; the intricate dance of a satellite in a quasi-periodic orbit; the fluctuations of predators and prey; the vagaries of the weather; the ever-changing patterns of flowing water or surging surf; all are bounded, yet none are predictable in detail. The Universe we live in *is* deterministic, yet it is also chaotic—not deterministic in any predictable or useful way.

How far we have come from Laplace's clockwork universe!

Further reading

Gleick, J., *Chaos: Making a New Science*, Viking Penguin, 1987.

A highly readable account of chaos theory that includes many topics I didn't have space to mention. ✦

About the Authors

Brian Stableford comes back to the pages of AMAZING® Stories after much too long an absence with "Skin Deep"—the sort of tale you might expect from someone who is not only a very good writer but also a sociologist.

Brian has been selling his science fiction stories since 1965, but until 1988 he had a "day job" in the Sociology Department of the University of Reading in England. He left that post to be a full-time writer, and has amassed a large variety of literary credits since then. His most recent publication in the United States is a novel, *The Empire of Fear*, which came out from Carroll & Graf in September.

"Skin Deep" is Brian's fourth short story for this magazine, and the first one since "The Engineer and the Executioner," way back in the May 1975 issue.

With "The Drifter," **Lawrence Watt-Evans** joins the small but growing group of writers who have appeared more than once in the new-format version of the magazine. This story is certainly different from his earlier contribution, "The Ghost Taker" (May 1991), which serves as a good example of his versatility. Regular readers of AMAZING Stories will also recognize Lawrence as the editor of the recently released anthology *Newer York*, which was reviewed in the September issue.

After an absence of two whole issues, **Phil Jennings** is back with a short account of one very unusual physics lecture. The story was originally titled "Dragons," but after he showed it to us Phil came up with an even better way of characterizing it: in retrospect, "Chapter Thirteen" is obviously what you get when the instructor decides to take one giant step beyond Chapter Twelve.

By the time this magazine is in print, we'll know if **W. R. Thompson** won the 1991 Hugo Award for Best Short Story. "VRM-547," which appeared in the February 1990 issue of *Analog*, is one of five stories on the Hugo ballot. We *could* have waited a month to print "Wacky Jack 5.1," on the chance that we would be able to describe Bill as a Hugo winner by then. But we *couldn't* postpone the opportunity to use a piece of his work in AMAZING Stories for the first time. If you like this story, you'll appreciate knowing that he's working on a novel-length tale featuring the same character.

The association between AMAZING Stories and **Jack C. Haldeman II** goes back almost to the beginning of his career. Jack's second published story, "Watchdøg," came out in the May 1972 issue and was reprinted in Lester Del Rey's "Best of the Year" collection. Since that auspicious start, Jack has had more than a hundred pieces of short fiction printed in various SF magazines . . . and those only amount to a fraction of his entire output, which also includes novels, mainstream stories, scientific articles, and poetry. "Line Item on a Dead Grant" is Jack's sixth appearance in this magazine and his first story for us since "On the Rebound" (March 1983).

Vivian Vande Velde has gotten exposure primarily as an author of children's books, which—as anyone who's tried it can tell you—are *not* easy to write. Her latest book, *User Unfriendly*, is scheduled for release this fall from Jane Yolen Books. "Time Enough" marks her first appearance in a professional science fiction magazine.

Paul Di Filippo doesn't normally write stories quite as long as "The Mill." But then again, anyone familiar with his work knows that Paul doesn't *normally* do anything. Despite the fact that this story takes up one-quarter of the pages in this magazine, we didn't think twice about buying it. "The Mill" is Paul's sixth appearance in AMAZING Stories, and his second contribution (following "Victoria," June 1991) to the new version of the magazine. ✦

The Mill

Paul Di Filippo

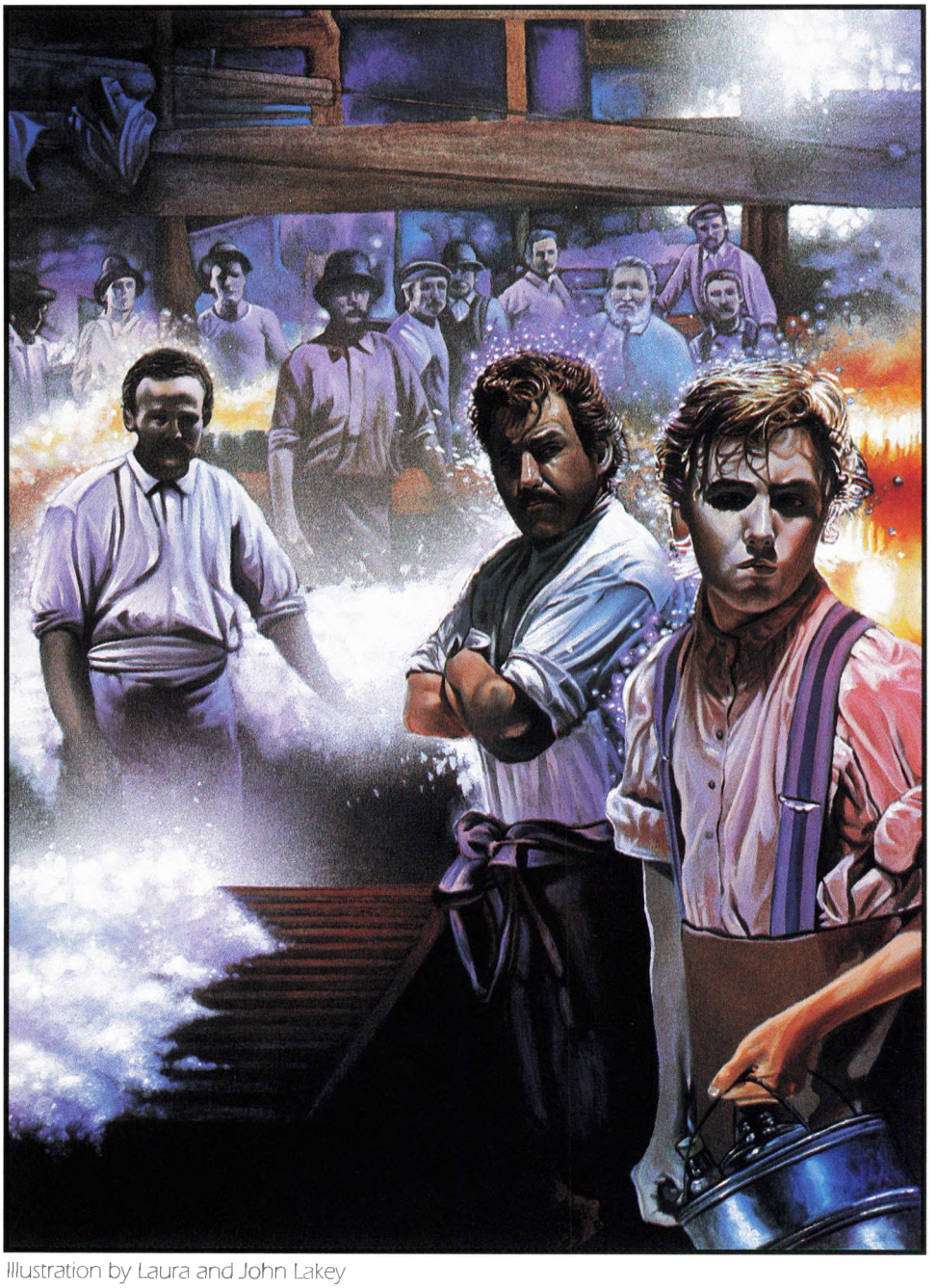

Illustration by Laura and John Lakey

1

Brickdust mottled the still Valley air around the noisy, scrambling boys, rising and quickly falling like their cries and shouts in thin ragged clouds that puffed from beneath their hands and feet as they clambered clumsily upon the vast irregular pile of broken and discarded bricks. Its dry powdery sun-baked scent —as familiar as the odor of homemade waterwheat bread —filled their nostrils, even as the settling pale orange-red powder layered their dull black clothing, interpenetrating its very weave and filtering through to veneer their skins with an ineluctable talcum, so that mothers, washing these boys later, would exclaim, "I swear by the Factor's immortal soul, this brickdust is leaking out from inside you. Why, I wouldn't be surprised to discover you're nothing but a human brick yourself!"

But the kettle-filled tub and the scrubbing with smoke-colored sea-sponges and the gentle feminine upbraiding would come later, and was

not to be worried about now. Now only the mad, ecstatic spirit of competition held sway, raging in their veins like the Swolebourne at flood. On and around the huge tumulus of bricks the boys swarmed, in a singleminded and almost desperate game to reach the top. Hands relinquished their holds to reach for the shirttails of those who surged ahead, to yank them back with savage glee. The boys seemed oblivious of the impact of the corners and edges of the broken blocks on their knees and shins and forearms, intent only on achieving the instant and insurmountable but fleeting glory of standing upon the pinnacle of the heap.

The boys ranged in age from five to just under twelve. No distinction in treatment was made between younger and older, all ages giving and taking equally in the mutual ferocity of the jagged ascent.

Dislodged bricks tumbled down the pile with a resonant clatter, and it seemed as if the pile would be leveled before any individual could reach the top. In the next instant, though, one boy emerged above the rest, eluding the outstretched hands that sought to capture him and deny him the top. Bent almost parallel to the slope of the heap, he clawed like an animal with hands and boot-shod feet working alike to reach the apex of the mound. Sweat turned the dust upon his face into a crimson paste.

All the boys seemed to realize at once that victory for this upstart was now foregone, all their own chances lost in the sudden burst put on by the boy now nearing the top. Instead of reacting badly, they gave in to their natural inclination to cheer an honest victor, and their wordless exclamations of struggle were replaced by exhortations and encouragements. "Go it, Cairncross!" "Yay, Charley!" "They can't stop you now, Charles!"

With the cheers of his peers ringing in his ears, the boy reached the top.

His heart was pounding, and he could hardly see. His white sweat-soaked shirt clung to him. He feared he might faint, but knew also somehow that he would not. It was not destined for his body, the instrument of his victory, after all, to spoil this moment. Getting his feet precariously under himself, he stood erect atop the crumbling mass, panting, bruised, sweaty, triumphant, and surveyed those below him, who had come to a complete cessation of movement, as if they had finally assumed the earthen nature of the brick they had so long played upon.

For the first time in all the years he had been competing in this brutal, vital, irreplaceable game, he had won. He had won. And there could be only one reason why. Tomorrow he turned twelve. When you turned twelve you entered the Mill to work. You played on the bricks no more. This had been his last chance ever to stand here, in unique and poignant relation to his fellows. And he had been granted the privilege. Through some unseen intervention of God or Factor, unwonted energy and determination had flooded his limbs, urging him on to the top, where now he stood with shaky knees. He had won.

For the next twenty years this moment would be the highlight, the indescribable epiphanical summation and measure of Charley Cairncross's life. Neither his first kiss from his betrothed nor commendation from his superiors, neither the birth of his children nor the praise of the Factor himself, would equal this heart-breaking instant.

Moved by a premonition of what this moment meant, under the impulse of forces he could neither identify nor control, Charley—risking a tumble and a cracked skull—began to jig and prance, whooping and yelling in a giddy crazy dance atop the bricks, unimpeded by his heavy leather shoes, like a fur-faced South Polar savage gloating over the skulls of his vanquished enemies. The boys below Charley watched in fascination, as the skinny lad flailed his arms and legs about. No one had ever done this before, and they were utterly baffled, but at the same time respectful.

There was no telling how long Charley might have continued his victory dance, had not noontime intervened. From some distance away came the loud tolling of a big bell, echoed up and down the Valley by remoter cousins. Its brazen strokes pealed out, shattering both Charley's visionary state and the hypnotic trance of his audience. Immediately boys began to descend the heap of rubble, brushing futilely at their clothes.

The strength suddenly deserted Charley's limbs. His ecstasy draining away, he collapsed wearily to the bricks, feeling his cuts and scrapes for the first time. After a moment, in the silence left by the departure of his companions, he looked up at the cloudless summer heavens. Several kites and cliff-kestrels glided lazily in the depths of the aquamarine heavens. The enormous blue-white sun was directly overhead. Noontime indeed, and lunch still had to be delivered, despite the unique and magnificent events of the day. Not even for transcendence—especially not for transcendence?—could the routine of Mill and Valley come to a halt.

Keeping his center of gravity low so as not to topple, Charley crabbed backwards down the pile. By the time he reached the ground, all the other boys had already vanished among the houses not far off. Charley hastened after them.

The brickdump lay on the outskirts of Charley's village, just beyond the outermost houses. In neat, garden-broken ranks the brick bungalows marched alongside the Mill with geometric precision. They clustered familiarly together, despite the abundance of open space in the Valley, as if making a united front against the mystery of the world around them.

By tradition, the master masons of Charley's village for centuries had dumped their waste here, on the last bit of level cleared ground before the land became wooded and began to slope up, forming the eastern side of the Valley. All the subsequent decades of weathering and decomposition had permeated the original soil with the sterile runoff from the pile, rendering it mostly fruitless. Among the trailing tendrils of discarded brick grew only the hardiest weeds. Sourpeas, their gaudy spring flowers only a memory now, their poisonous yellow pods harvested occasionally as an emetic; dangletrap, its jaws snapping softly on the odd insect; maidenshair, its

black tendrils lying wispily atop red shards. . . . A foot-beaten path, trod by generations of boys, led back to the houses.

Halfway across the waste, the path was intersected at a right angle by a twin-rutted dirt road with a thin grassy median. The road, like the Swolebourne, like the Mill itself, ran north and south, leading in the latter direction down the length of the Valley to where the Swolebourne emerged from its human-made brick shell. Here, new construction was always going on.

Once among the shadows of the somber brick dwellings—each two stories tall and divided by an interior wall so as to house two separate families, whose compact and well-tended garden plots flanked each proud owner's door, serving in lieu of useless grassy lawn—Charley speeded up his pace. He knew his mother would be waiting for him. More important, so would his father.

On the paths threading the village, Charley passed many boys bent on errands identical with his. They had already been home, however, and now raced by carrying tight-lidded tin pails that they swung by their handles, and stone bottles stoppered with ceramic plugs and wire caps, suspended from twine knotted around the bottlenecks. The stone bottles were slick with condensation, their contents cool from all-morning immersion in the family wells.

Soon Charley reached the doorstep of his house, indistinguishable from all the rest and yet so deeply and immutably known by him as his. A woman with plaited honey-colored hair stood impatiently in the doorway, tapping a foot beneath her long baize skirts and holding his father's lunchpail and beer-crock. The left corner of her lips twitched the big dark beauty-spot above it in a familiar gesture of annoyance.

His mother cut off Charley's attempted explanation of his lateness and disheveled condition. "No excuses, boy. Just get your Da's meal to him before it gets cold." Without even stopping, Charley grabbed the pail and bottle and took off.

Down the narrow cindered lanes—which had just lately dried completely after the final spring rains—Charley raced, his tough leather-soled high-topped shoes crunching the grit as if it were rock candy. Eventually he caught up with the other boys, who had not been so far ahead of him after all, and who—by an unconscious and daily urge to gregariousness, as if they were determined to offset now the future semi-isolation they would endure when tending their machines in the Mill—had funneled together from their various starting points and subsequently moved in a jubilant pack through the last shadowy stretch of serried houses. Occasionally a pail would bang up clumsily against one of its mates, eliciting dull clunks and anxious belligerent warnings to "watch out for my Da's dup, you clodder!" Some boys carried two or more pails, for both brothers and father.

Sighting Charley, many of the boys whooped out fresh congratulations for his recent performance on the brick-heap. Several of them mimicked his celebratory dance, infusing it with an absurdity he had surely not felt. Had he really looked so foolish? Or was it the perception of his friends that was distorting the reality of what he had experienced? Not for the first time, Charley felt distanced from the other boys. He wondered whether anything as intense as what he had just experienced could ever be truly communicated or understood. . . .

At last the boys burst out from the maternal embrace of the houses, leaving behind shadow for diamond-hard translucent sunlight that fell sharply on a wide swath of wildflower-spotted, untamed emerald field that stretched away to the Mill. The cindered path continued across this intermediate zone between home and work, heading toward the immense brick structure that was the Mill.

The Mill was ungraspable from this vantage in its entirety, looking merely like a high endless madder-dark windowless wall capped by a mansard roof whose expanse of thick slates looked like the spine of some unknown beast. It stretched to right and left as far as one could see, dividing the Valley like a ruler laid across a bear-ant hill. Its majestic presence was so much a given, so taken for granted, that the boys truly did not even really see it. Their attention was focused on meeting their fathers.

The boys moved on through the fragrant waist-high unscythed grass, spreading apart a bit, some stopping to investigate a flower or insect, then having to run to rejoin the rest. In a minute or so they had crossed this interzone and entered upon the territory of the Mill proper. Here, as at the brick-heap, the ground was bare of anything but the most tenacious and hardy of weeds, due to the accumulation of generations' worth of waste-oil. The smell from the organic detritus was dense but not overpoweringly unpleasant, especially to those who had lived with its smell engrained in the creases of their fathers' rough hands ever since those selfsame hands had first reached to absent-mindedly pet the new babe in its cradle. The air here smelled rather like slightly rancid fried food.

Charley and the others hurried across this oily waste toward an opening in the Mill's flank. A wide double-doored portal of thick planks, this entrance was marked by the rising of a clocktower up from the roofline above its location, and also by a heterogeneous collection of backless benches scattered around just beyond the entrance. Above the benches, the gilded hands of the clock hung at ten past the hour. The benches were already filling up with sweaty, hungry, brawny, tired-looking men, and many of their older sons, looking like shrunken or as yet uninflated replicas of their sires.

When the lunch-carriers saw their relatives waiting they picked up their feet even more fleetly and began to cry out like a flock of particularly limited birds. "Da! Da! Da! Da!" The men and workerboys perked up, hearing these youthful voices and knowing their meals had arrived. More and more laborers—those who worked farther inside the depths of the Mill and so had farther to walk for lunch—continued to pour out of the doors.

Straggling alongside Charley in the rear was poor Jemmy Candletree. The boy had six or seven pails to lug. His mother, a widower, supported herself and Jemmy by supplying meals to childless and unmarried men.

Charley silently took one of Jemmy's pails; the lad smiled gratefully.

On the far side of the Mill, Charley knew, aspects of this same scene were being mirrored. It gave him a curious sense of twinness to think about it.

Now the lead boys had begun to circulate among the men, handing out the lunchpails and stone jugs they had ferried from hearth to hand. The men assumed a certain dignity with the arrival of these tin vessels and crocks. Each set his shoulders back somewhat more stiffly beneath his coarse jacket (donned in the morning upon departure, doffed once inside the Mill to allow shirtsleeved freedom, and redonned at lunch), as if to say, "My wife and oldest homeson have both done their part once again. Let all see and note this." Then they fell to disassembling their tripartite pails. A twist unlocked the first section from the second. Removal of the top lid, which was balanced carefully on the knee throughout the meal, always revealed inside this first container an enormous slab of dense waterwheat bread smeared with orange butter, nearly a quarter of a loaf. The container below this held the main course: a hot, fragrant stew of rocklamb and capers, say, or two groatgoat chops, or some kind of meatloaf redolent of greennut shavings. The final sealed container held dessert. Berry cobbler, stuntapple pie, spicebark cookies.

The sounds of restrained but hearty eating filled the summer air. The men were as yet too intent on sating their Mill-born hunger to engage in conversation.

Charley shuffled from foot to foot, awaiting the arrival of his father, who worked in roving, some distance away. He examined the lone pail he carried while he waited. His father's initials—RC—were awkwardly engraved on cover and bottom. The alphabetic furrows in the tin held ineradicable dirt from a thousand handlings, which, scrub as she would with boar-bristle brush, his mother could never totally remove.

Suddenly, Charley experienced a revelation. Tomorrow, he would not be carrying this pail. That task would fall to his little brother, Alan, whose small hands would have to manage two lunches. He—Charley—would have his own lunchpail. Already it must have been bought at the Company Store, and even this minute was probably sitting on a shelf in the kitchen. Tonight he would have to scratch his initials on it. CC. Tomorrow he would be sitting here with his father, probably famished and more tired than he had ever been before. No more eating at home with his mother and Alan and Floy. . . .

CC. See, see. See, see what would come.

It was all too strange for Charley to really fathom. How could he travel from his temporary yet eternal enshrinement atop the brick-heap to the interior depths of the Mill in less than a day? It seemed impossible. . . .

Charley lifted his gaze once more to the door. His father was coming through.

For one brief moment, as the man became visible just within the tenebrous interior of the Mill and yet had not fully emerged, he was dusted with light. All over his bare skin and clothing danced tiny motes and atomies of radiance. He looked dipped in some marvelous powder that did not reflect light, but created it, engendered it of its own miraculous being and nature. Charley's father wore, for the briefest second, a chatoyant suit of fireflies. It was, of course, only a coating of the airborne fibrous lux particles that were everywhere within the Mill. And as soon as the man came completely into the sun-drenched outside air his suit of lights disappeared, leaving him clothed like the others, in drab utilitarian fustian weave.

Charley ran to his father and handed over his pail and beer-crock. The man nodded wordlessly, tousled Charley's brown hair, and moved to an empty spot on a bench. He dropped wearily down, as if his bones were lead. The inner containers soon ranged along his leg as on a serving board, Roger Cairncross dug out a spoon from his pocket, polished it on his sleeve (thereby probably depositing as many particles on it as he removed) and began to eat, shoveling stew beneath his droopy mustaches like a man filling a ditch.

Normally Charley would have rejoined his peers in their roughhousing as they waited for the empty pails which they had to bring home. But today, he wasn't quite sure who his peers were. So he hung quietly by his father's elbow while the man and his comrades ate, not venturing to speak.

His father seemed not to mind. At least he did not gruffly order Charley to move off. Perhaps he too recognized the in-between nature of the day and of Charley's state of mind. At last, with a final swipe of his bread through the remnant gravy, the elder Cairncross was done. He packed up the assemblage of containers neatly and handed them back to Charley. He brought a pipe out from within his jacket, filled it with smokeweed and began to puff. His fellows were doing likewise, down almost to the youngest. Charley coughed as the acrid smoke reached his nostrils. He vowed then and there never to acquire so inexplicably vile a habit.

The lofty clock-hands stood at half-past the hour. The first man to speak addressed not his fellows so much as the air in front of him. "I hear that the new mill is nigh finished."

It was a kind of unmistakable intonation that differentiated "mill" from "Mill." The latter, of course, referred to the whole vast multiunit complex that stretched from the northern end of the Valley more than three-quarters of the way to the south, a distance of nearly five miles. Big-em "Mill" meant more than the building and its contents and products, too. It stood for some numinous ideal, a community that included everyone in the Valley, something larger than any individual, and deserving of the ultimate loyalty. Something that stretched ultimately to the stars.

With a more familiar and less respectful tone, "mill" meant literally the individual production units that made up the Mill. Each small-em mill was a collection of men and machines capable of taking the raw lux fibers and producing finished cloth. These mills commanded a more earthly loyalty, a certain fierce pride in the ability of one's mill to outproduce all the others in quantity and quality, and to field a ball team that would win the annual

championship. Each mill was approximately twenty years older than the contiguous one immediately to the south of it.

Charley's mill was not the oldest nor the youngest, being situated somewhat toward the middle of the whole complex. The youngest mill was still building. The oldest was a desolate mass of charred timbers overgrown with bramblevines and fronded at their bases with waterplants through which the Swolebourne rushed at the start of its channeled and tamed subterranean passage beneath the Mill. This progenitor mill had caught fire and burned down in a time beyond Charley's conceptions, when there had been only three active mills. Now there were fifteen. "Many mills make the Mill" was a saying often trotted out when one wished to indicate that there was strength in numbers, or diversity beneath a common facade.

"Aye, that's what I hear also," said another man. "And we all knows what that means. A new flood of clodders in from the farms, looking for an easy life. Probably some hellacious towners who've gotten one too many gal in trouble and been drummed out. A trapper or three who's getting too old to walk his lines anymore. Well, they'll soon learn. They all settle down to Mill life after a while. I reckon we was all clodders back somewhen."

The men all nodded agreeably at the old wisdom. They knew that after a decade or two the workers at the new mill would be indistinguishable, save for perhaps a slight accent, from those who had lived in the Valley all their lives.

"They'll not be any challenge in the games at first," said a man with a missing arm, lost in an inattentive moment inside the Mill. "Especially not to the Blue Devils." Everyone smiled at the mention of their own team, as they pictured the frenetic sweaty pleasure of summer twilight games, kicking and passing the scarred lucky leather ball until the moon and stars themselves were inveigled out to watch. It seemed then that the remainder of the talk would center around the upcoming season's games. But Charley's father—who had been frowning and staring down into the oily dirt since the first mention of the new mill—diverted the talk with a blustery outburst. "And why do we even need a new mill, I ask you?"

All the men turned their eyes on Cairncross. Charley felt nervous, worried and defiant for his father's sake, all three emotions jumbled up together. "Ain't life hard enough," Cairncross continued, "trying to produce the best goods we can, so's that the Factor will give us a rich weight of gold that will guarantee a fair share for every worker, enough to tide us through the year between his Lord High Muckamuck's visits?"

Cairncross stopped for breath, glaring intently at the others, who appeared not a little frightened at this mild derogation of the Factor. "Now we've got a new set of competitors, more mouths to divide the Factor's beneficence among. Unless the Factor ups the yardage he's willing to purchase, we'll all owe the Company Store our very breaths by the time the new mill is geared up to full production."

An older man spoke up. "The Factor must know what he's doing, Roger." (Here the elder Cairncross mumbled something that Charley supposed only he could hear: "He's only human.") "He told us nigh twenty years ago to start building the new mill. He must understand his market, wherever he sells the luxcloth, out there among the stars. Could be he's expecting a big surge of new customers, and needs the new production. You're too young, but I remember when the last mill started up, almost forty years ago. People were saying the same thing back then. And look, we still earn a good living."

Cairncross spat. "Aye, a good living, if you call it fair that the sweat of a man and his sons goes for naught but to survive until he dies—and dies too young most times at that—with not an hour or an ounce of energy left for anything but a game of ball. Think what the Factor could do for us and our world if he wished—"

Now the men laughed. Charley winced for his father's sake.

"Sure," said one, "he could make us all deathless like hisself and we'd all fly through the air all day and live on moonbeams and calculate how many angels fly 'tween here and the stars. Away with your stuff, Roger! It's enough for any man to make the cloth and raise his bairns and tussle on the gamefields. That's life for our kind, not some airy-fairy dream."

It seemed that Cairncross wanted to say more, but, feeling the massed attitudes of his fellows ranked against him, he only stood, pivoted and stalked off back into the mill. The subsequent banter about ballplaying was muted and desultory, under the pall raised by Cairncross's wild talk, and the men soon shuffled back into the mill, a few minutes before the tolling of the bell that signaled the end of their break.

The boys stood amid the benches for a time after the men had gone, idly picking at the weather-splintered bleached wood of the seats or kicking greasy clods of soil. Their mood seemed touched by the dispute that had arisen among the men. A few boys looked curiously but not accusingly at Charley, as if he somehow could explain or account for his father's untenable position.

Charley could do no such thing. He was too confused by his father's arguments to explicate them. He had never seen his father act precisely like this before, or spout such unconventional ideas—although there had been times, of course, when his father was quietly sullen or explosively touchy; whose father wasn't?—and he wondered if his own near-future entry into the Mill had anything to do with his father's novel mood. Charley returned the boys' glances boldly (some of his exultation at conquering the brick-heap still lingered like a nimbus around and inside him) and soon they looked away. A few seconds later, their natural exuberance had returned and they raced off back across the flowery strip, toward home and an afternoon's boisterous roistering.

Charley did not follow. He felt still too confused to abide by his regular schedule of mindless afternoon gameplaying. He had to get off somewhere by himself, to think about things. Swinging his father's empty pail and jug by their handles of tin and twine, keeping to the

strip of waste-sown ground, Charley headed north, the serpentine bulk of the Mill on his left, the massed and brooding houses on his right. When he passed the northernmost house belonging to his own village, with the southernmost houses of the neighboring village still some distance off, he turned east, away from the Mill, across the trackless meadows. The hay-scented sun-hot layer of air above the chest-high grass was filled with darting midges, the way he imagined the luxthick air in the Mill to be filled with lux. Charley batted them aside when they swarmed annoyingly about his face.

The land began to slope up: houses fell away, behind, below, to south and north. Slender sapodilla saplings, advance scouts for the forest ahead and uphill, made their appearance in random clumps. Jacarandas and loblollys began to appear. As tree-cast, hard-edged shade-blots started to overlap, the grass grew shorter and sparser. The final flowers to remain were the delicate yet hardy lacewings. Eventually, under the full-grown trees, the composition of the floor changed to leafduff and gnarly roots, evergreen needles and pink-spotted mushrooms. Small rills at intervals purled downhill, chuckling in simpleminded complacency, bringing their singly insignificant but jointly meaningful contributions to the Swolebourne.

"It takes many mills to make the Mill. . . ."

Charley labored up the eastern slope of the Valley, not looking back. The air was cooler under the tall trees, insects less prevalent. There was only the isolated thumb-thick bark-beetle winging like a noisy slingshot stone from tree to tree.

In the arboreal somnolence, so reminiscent of Layday services, with the buzzing of the beetles standing in for the droning of Pastor Purbeck, Charley tried to sift through the events of the morning, from his triumph on the brickpile to the confusing conversation among the men. There seemed to be no pattern to the events, no scheme into which he could fit both his joy and his bafflement. So he gave up and tried just to enjoy the hike. At last he came out upon the ridge that marked the border of the Valley, the terminator between familiar and foreign.

Here, high up, there were bald patches among the trees, places where the rocky vertebrae of the hill poked through its skin of topsoil. Walking south along the ridge, Charley came out of the trees into such a spot. Sun-baked stone made the air waver with heat-ripples. It felt good after the relative coolness under the trees, like snuggling under the blankets warmed by heated bricks on a midwinter's night.

Setting his father's lunchpail down on the grass, Charley climbed upon a big knobby irregular boulder, got his feet beneath him (no one contested this perch with him), and looked around, away from his home. The crowns of the nearest trees were far enough downslope to afford a spectacular vista.

Beyond the Valley, unknown lands stretched green and far to the east, ending in a misty horizon. Sun shouted off a meandering river. Charley suspected it was the Swolebourne on its post-Valley trek, but was not sure. There was no immediate sign of man to be seen, but Charley knew that somewhere a day or so away there were towns and villages and cities and farms, where shoes and meat and the harvested lux came from, in tall-wheeled, barrel-loaded wagons drawn by drowsy wainwalkers, their horns spanning wider than a man's reach. Those places were too unreal to hold Charley's interest. He was Valley-born. Back toward the rift that held his world he turned.

He could see the entire length of the Valley from this vantage. It was an impressive spectacle. In the north, the Swolebourne tumbled in a high frothy falls from over the lip that closed that end of the Valley. There was a legend that claimed that a whole tribe of aboriginals had hurled themselves from this precipice to their mass suicide, rather than submit to the presence of the first human colonists. The mournful chortling which at times could be discerned under the falls' roar was said to be their ghostly lament, and did indeed resemble the noises which the fur-faced natives made, said those trappers who had actually penetrated to the current-day haunts of the abos.

From its creamy violent pool the river rushed down its man-modified channel, its energy for some small distance untapped by the machinery of the Mill.

Soon enough it was among the blackened beams and crumbled fragments of walls that could barely be discerned at this distance and which betokened the original mill that had long ago gone to its destruction as the result of some careless use of fire, a danger each child was warned against daily. The brawling river vanished next beneath the first still functioning mill, through masonry arches. A gentle sussurus from River and Mill machinery filled the Valley.

Funny, thought Charley, how you only noticed some things when they were remote. . . . Charley's eyes followed in one quick swoop the variegated length of the Mill, each of its sections distinguishable by the subtle and unique coloration of its bricks: generational shades of rose, tawny, pumpkin, autumnal leaf. He let his eyes bounce back from the southern end, where the Swolebourne emerged a pitiful tamed remnant of its upstream proud valorous self, and where the minute figures of hired out-Valley laborers could be seen finishing the upper courses of the new mill.

Starting with the oldest section, Charley recited aloud all the familiar and comforting names of the Mill.

"Silent Sea Warriors, Swift Sparrows, Deeproot Willows, Wild Wainwalkers, South Polar Savages, Red Stalkers, Factor's Favorites, Longarmed Bruisers, Blue Devils, Lux Jackets, Eighteyed Scorpions, Landfish, Ringtails, Greencats, Blackwater Geysers."

This litany of millnames was vastly reassuring, a bastion of every child's daily talk and boasting, source of endless speculation and comparison, during winter idleness and summer game-fever.

Suddenly Charley wondered what the new, sixteenth, mill would call their team. How strange it would be to have a new name associated with the other time-hallowed ones. Would such a thing ever happen again in his life-

time? It was all up to the Factor, of course, and his motives were beyond fathoming.

Charley's attention turned to the houses that paralleled the Mill on both its eastern and western sides. A village consisted of the families on both sides of the individual mills. Each section had its mirror-image dwelling places bunched together opposite each other, with the Mill itself intervening. There was a single corridor that ran straight through the width of each mill permitting access over the river and between halves of a village. This corridor had no doors into the mill proper; that privilege was denied both women and underage children.

Gaps—playing fields fringed by wildness—separated each mill's housing from the rest on the same side, contributing to the team-feeling and individual minor differences that marked each small subcommunity.

Charley tried to imagine what life would be like in another community. He felt a queer sorrow for girls, who had to move out of the villages of their birth if they married a man from another section. Would such a thing happen to his sister Floy? He hoped not, for he would miss her.

Thoughts of Floy made him want to see her, and so he clambered down off his rock and began his descent to the Valley floor. He guessed he felt better for his walk. He chose to disregard his father's bitter talk about the Mill. The Mill was the only life Charley desired. He wanted to enter more deeply and completely into its ritual-filled activities and complexly articulated duties, not to examine or criticize them. He would not let tomorrow—the day that marked his first steps into such a life—be spoiled.

Back down in the Valley, Charley rushed home. He burst into his house, swinging his father's lunchpail just like he had seen the men swing their lanterns as they walked in front of the wagons at night that carried people back from far-off games down at one end of the Valley or the other. He found his mother, Alan, and Floy all in the same room. Alan was playing with a set of wooden blocks while Floy, sitting in a chair, was having her hair braided by her mother. Floy was inordinately proud of having the same honey-colored tresses as her mother, and wore her traditional plaits proudly. Such elaborate, time-consuming hairstyles were a mark of status in the village, showing that mothers could afford to spare time from housekeeping and cooking and washing, and there were few women who would deny their rare daughters such attention.

"Where have you been?" asked Charley's mother first thing.

"Oh, for a walk," Charley said. "I didn't feel like being with the other boys today."

Charley's mother said nothing, but continued to weave her fingers among Floy's rich hair. Charley grabbed a waterwheat biscuit, sat and munched and watched until the task was done. "All right, Florence," said her mother. "You may go out now if you wish. But be back in before the bell tolls three, since I need you to baste the roast."

Floy stood, her head with its coiled grandeur held high, and Charley grabbed her hand. Alan got to his feet and tried to follow them, but before Charley could deny him, their mother caught up the younger boy, saying, "And you come with me, mister, there're peas to be shelled." Charley and Floy left the house, heedless of Alan's shrill protests.

Outside they meandered down the narrow close graveled streets. Odors of cooking drifted from each open window, along with household noises: the clatter of pewterware, the clink of glasses.

Holding his sister's hand as he always did on their walks, Charley felt an unlooked-for estrangement in place of the comfort he had expected. Floy looked somehow older and different to him today, inexplicably more mature than her fifteen years. Her starched white ruffled shirtfront seemed more like his mother's bosom than the flat expanse of linen he thought to remember from yesterday. Could so much have changed in a single day, or was it just his senses playing tricks? The changes left Charley feeling tongue-tied. Finally, he ventured an observation on the matter closest to his heart.

"Tomorrow I enter the Mill, Floy."

"I know," said Floy rather blandly. She seemed distant from Charley today, more intent on casting her gaze about as if for witnesses to her coiffed glory.

Charley was discomfited. "Well, will you miss me?"

Floy favored her brother with a look of impatience. "I'll still be seeing you each night, won't I? You'll hardly be getting married yet, I think."

Charley felt frustrated. "No, of course I shan't. You know I don't mean any such thing. But I will be gone all day with Da, and we won't be able to talk and play for hours as we used to, nor take our lessons together. Will you still think of me, when I'm in the Mill? What will you do all day with yourself? That baby Alan can't take my place, can he?"

"No," said Floy in a somewhat absentminded manner, as her attention was distracted by the sight of showoff Hal Blackburn chinning himself on the branch of a pear tree. Blackburn was inordinately large for his age, and his biceps bulged as he pumped himself up and down. Charley found his leering expression distasteful.

"I don't know quite what I'll do," continued Floy. She released her brother's hand and primped at her hair. Blackburn switched to a one-handed grip and began to hoot and scratch at himself like a purple vervet. Floy turned away from him in a huff. "I suppose I'll find something, though."

This was not the protestation of undying grief that Charley had been longing for and, in truth, half expecting to hear from Floy (he had even, he admitted, pictured tears), but he supposed it would have to do, and he sought to find some solace in it.

They promenaded among the houses in silence for the rest of their final afternoon together, each preoccupied with his or her own thoughts. When it was time for Floy to help with supper, Charley went and sat on their stoop, awaiting his father. The man returned at last, after six. He had been gone since seven that morning. He looked utterly vanquished, and barely noticed Charley as he brushed past him.

After supper, his father sat on the wainwalkerhide chair (still owed for at the Company Store) that was reserved for him alone and silently smoked his pipe. The children played quietly, and their mother darned clothing. Buttery light from the oil lamps flowed over forms and faces, furniture and floor.

After a time, their father spoke. "That blasted Otterness was on my back all day. Claimed I mixed two incompatible luminances. Ever since he made Master Luminary he's been unbearable. At forty he's the youngest ever, and if you imagine he'll once let you forget it, then you'd believe the Lux Jackets could take the championship."

Charley's mother said nothing, realizing that attentive silent agreement was all that her husband wanted at the moment. The man smoked in silence for a full two minutes before speaking again.

"I tried telling them today what I believed, Eliza, and they did naught but laugh."

Charley's mother put down her work. "You know no one likes to hear bad things said about the Factor, Rog. I don't know why you even bother."

Charley's father slapped the arm of his chair. "Damn it, it's not even as if I'm proposing anything other than the Factor leave us alone. If he won't share the knowledge of his starways with us, at least he should take his superior self away, and let us try to find our own path again. As it stands now, he's like a dam across the stream of our progress. There's been naught new done since the Factor came all those centuries ago. Things were different then, and could be once more. We were picking ourselves up from the Dark Times, learning what we could do again. Then came the Factor, and knocked the spirit right out of us. Since then we've stagnated. It's not healthy, I say. No more than if the Swolebourne were motionless and covered with pondscum."

Shaking her head, Charley's mother said only, "I don't know, Rog. I can't say. Life seems good."

Charley's father puffed furiously on his pipe, but said no more.

As Charley lay in bed that night, quilt atop him like the mantle of a cape-wolf, he puzzled over his father's words, but could make no sense of them before he fell deeply asleep. That night, no dreams left their traces, not the ones of his triumph atop the brick heap, nor those of the day to come.

And in the morning he got up and had a breakfast of porridge with his father and he saw his lunchpail sitting beside his father's on the shelf and he realized he had forgotten to cut his initials into it and would have to do so later and he set out into the dewy morning beside his Da down a familiar path that looked utterly strange and soon he was across the oily waste and among the clot of men and boys, some mingling and joking and some silent, and intricate odors were wafting out of the open Milldoors at him and the line of men was moving forward and beyond the doors his light-adjusted eyes could not penetrate the darkness and as each man or boy entered—save Charley alone—his clothing sparked with lux and before Charley knew it he had stepped over the threshold inside.

2

The pale grey leaves of the dusty-miller tree diffused a scent like minty talcum. The branches of the dusty were long and slender, withes useful in basketry, and arced and drooped to form a secret bower around the bole. From some distance off, fatwood torches spiked into the turf on the sidelines of the playing field cast their wavering illumination over the ghostly foliage, sending shadows skittering over the tapestry of leaves without penetrating the deeper darkness of the arboreal shelter. The shouts of the spectators clustered around the sides of the game field rose and fell in linkage with the action of the players, the one an enthusiastic reciprocal of the other. Panting and grunting accompanied the fervent play, intermixed with the solid thump of shoe leather making contact with a scarred leather ball. The game was in its final quarter, and the Blue Devils were battling to maintain their one-point lead over the Landfish.

Inside the canopy of leaves, Florence Cairncross leaned in a swoon against the rough trunk of the dusty. The familiar odor of its leaves filled her head with a piquant strangeness. Everything was so much altered. . . . The excited voices of her friends and neighbors and family sounded like the inhuman cries of birds or animals. The light of the torches seemed to issue from watery depths, as if drowned beneath the Swolebourne.

An exclamation from one of the players reached through the tangle of leaves. "Pass it, pass it!" Was that her brother, Charley, calling? Perhaps, perhaps. . . . It was so hard to tell; his voice had changed over the last year, maturing into a novel male roughness. And under present circumstances. . . .

Florence felt a tugging at the laces of her camisole. Her starched outer shirtfront already gaped apart, one bone button missing, lost amidst the dead leaves of past seasons which bestrewed the ground at her feet. The fingers at her laces suddenly found the simple knot that secured the top of her undergarment, found its trailing end, pulled and undid it. Those same fingers poked through the criss-crossed laces halfway down her midriff and tugged. The lace-ends slid through the double-stitched eyelets as easily as water through a sieve.

She could see nothing in the tenebrous enclosure, but closed her eyes anyway.

Those fingers. . . . How was it possible for a grown man to have such skin, unscarred by machinery, untainted by the stink of lux and oil . . . ? Despite his maturity, they were still so smooth and uncallused, almost as smooth as a girl's. That had been one of the first things she had noticed about Samuel. . . .

* * *

The game that Layday had been scheduled for noon, to allow time for morning services. A night game during the workweek would have involved too much travel for the Blue Devils, who had promised to give their fledgling opponents the advantage of their home field. Although the actinic sun was high, the game had not yet

begun, for heavy rains the previous day had washed away the chalk lines of the playing field, and the men were still busy demarcating the borders of their eventual struggle. Under a spreading horsetail tree there was the usual broad trestle table set up with food and drink. Big stone jugs of pear-apple cider, both hard and soft; pies and loaves; cheeses and hams. People crowded around the refreshments, chattering. A bit more than half the faces were familiar. The new village was still underpopulated, all its houses and outbuildings still raw-looking, and the visitors, although representing only a portion of Florence's community, actually outnumbered their hosts. This was the first engagement between the Devils and the Tarcats, as the newest mill had denominated their team, the first time the two villages—one long-established, the other barely settled—had had a chance to mingle.

Beyond the village the Valley mouth opened out onto misty blue-green horizons, the hills on either side sloping away into the flat plains like tendons disappearing into the torso of the earth. It was the closest Florence had ever been to the Valley's embouchure, and its nearness made her giddy.

Talking with her best friend, Mabel Tench, one of the few village girls her own age, Florence reached for the handle of a cider jug at the same time the stranger did. His soft palm fell atop hers, engulfing it in a strong yet velvet grip. Florence felt the blood rush to her cheeks.

She turned her face to the stranger, who had yet to release her hand. His eyes were as blue as gillyflowers, his smooth jaw as strong as the rocks from which the Swolebourne tumbled. He was dressed in a ball-playing outfit: a jersey striped with his team's colors—green and gold—and leather shorts. His legs were well muscled and very hairy. Florence felt her flush deepen.

"Please excuse me, Miss," said the man, his words accented strangely. "Mere thirst is no excuse for inconveniencing such a beauty as yourself. Allow me to fill your mug for you."

Finally he released her captive hand. Hooking the big jug's handle with his forefinger, he somehow swung it neatly up into the crook of his arm without spilling a drop. Relieving Florence of her mug, he poured a golden stream of tart juice into it, then handed it back. At that moment one of the man's teammates called him. "Snooker, the game's about to start!"

The man set the jug down, made a little mock bow, then trotted off to join his team on the field.

Florence winced a little at the name. Could such an elegant fellow really answer to "Snooker"? She felt a twinge of proprietary anger, then caught herself. What connection existed between them that could give her the right to even worry about such things? Quite obviously, nothing. Nor would there ever be. Most likely . . .

Through innocent questioning Florence discovered that the stranger was named Samuel Spurwink. Along with several other villagers he had relocated from distant, cosmopolitan Tarrytown. She found one of his townsmen standing on the sidelines, a short older man with a brown beard thick as thatch.

"That fellow who just scored a moment ago. He plays quite well."

"Snooker Spurwink? Aye, I suppose so. If you fancy a style where you dart about like a drunken hummingbird, stopping to ogle every petticoat on the marge. Oh, he's a sly one, that Spurwink. More used to indoor sports, if you take my meaning. Bending an elbow, letting fly a dart."

Florence felt irked at the man's denigration of Spurwink. "If he's such an idle tosspot, then what made him come to the Valley? Although our work is noble and much esteemed, as bringing honor from the Factor to our humble world, we don't have an easy life here, turning raw lux to fine cloth. I can't see a figure such as you paint voluntarily abandoning all the pleasures of town for our strictured Mill life."

"Well, you see, young Sammy had quite a surfeit of working in his Da's butcher shop. Blood-covered aprons clashed with his finery, it seems. And then there was talk about Sammy and the mayor's wife . . . say, young lady, just how old are you?"

Florence huffed. "Old enough to know not to listen to idle gossip." She moved off, leaving the man chuckling to himself.

During the game Florence found herself cheering the Tarcats—and especially Spurwink. Her parents and fellow villagers smiled indulgently at her. "Such a good girl, to make these newcomers feel welcome to the Valley, even with her own brother out there playing his heart out."

The Tarcats lost to the Blue Devils, ten to one.

But Spurwink that day won something invisible.

* * *

His lips were on her neck now, and she swiveled her head to expose more of that graceful expanse to his nuzzling. Her laboriously fashioned plaits, pinned atop her head with blue-bone clips, rubbed against the tree and came loose, falling to frame her face. Then his hand was inside her undone camisole, molding itself to her breast, cupping the fruit of her flesh as he had cupped her hand only a short month ago. He smelled of a spicy cologne. Florence had never known a man to wear scent before. His signature smell mingled with the perfume of the dusty-miller leaves in a heady blend.

His kisses stopped at the base of her throat. "Oh, Sam, lower . . ." He complied, while the crowd roared a million miles away.

The second time they met had been at a night game between the Devils and the Red Stalkers, the latter a team upstream of the Devils. Spurwink had materialized at her side as she stood apart from and on the outer edge of the spectators. From behind he had covered her eyes and whispered, "Hello, Miss Pretty Puss. Can you guess who this is?"

She was both surprised and unsurprised to have him there. On one level she had had no thoughts of him, her mind drifting among the minutiae of her daily life. On another, deeper level, she had somehow known he

would come. In that first moment her surprise and consternation weighed slightly heavier in the balance of her emotions, and she hesitated before speaking.

"Come now, don't you have a pleasant word for a man who's labored like a dog all day, then walked an hour to be by your side?"

"I . . . I'm flattered."

"Ah, 'tis a rather dubious mouthful—seems to speak more of your feelings than my prowess!—but I'll take it. You women are all so cruel and haughty, it's no wonder the Factor chose to make so few of you. Though some of the savants back in Tarrytown claim the scarcity of gems such as yourself is merely a queerness in our tuck. Think of that! Maybe if your mother had eaten a sea-pickle or three, she'd have had a sister for me to chat up too."

Still blinkered by his soft hands, Florence said, "I . . . I can't imagine such a thing."

Spurwink uncovered her eyes and twirled her around to face him. No one was looking, collective attention massed on the game. "Then imagine this!" he said, and kissed her on the lips.

Florence pushed Spurwink back, both hands on his hard chest. When he was at arm's length, however, she did not remove her palms from his shirt.

"You play rather fast and familiar, sir."

"Have you never heard that fortune favors the bold?"

"In some endeavors, perhaps, but not all."

"It remains my universal motto nonetheless."

"An intriguing steadfastness. Would you care to explain more?"

"By all means. But let's meander to quieter pastures."

"If you wish."

They walked away from the crowd and the torchlight, the trodden night-damp grass exuding its living breath. Spurwink attempted to press his hip to Florence's, but she skipped away. He sighed melodramatically. She ignored him. He began to talk.

Spurwink's exotic speech, his foreign tones, his barely concealed insinuations, all combined to fill Florence's head with dreamy visions, colored in all the brilliant shades of the rainbow missing from the drab black and brick-red environment of the Mill. His words seemed to pass directly from his lips into her imagination, with barely a stop to be interpreted by her conscious mind. Her familiar surroundings disappeared, to be replaced by peacock images of gay dances, airy pavilions, candle-lit canopied bedchambers. . . .

Florence had come to a stop by a stand of jojoba shrubs. Spurwink advanced, backing her up into their prickly embrace. He clasped her face in his hands and kissed her again. Florence did not resist.

"Floy! Floy! Game's over! Time to head home!"

It was her foolish little brother Charley calling, shattering the spell she had been in. Florence pushed Spurwink back, rearranging her skirts where the shrubs had rucked them up.

"Factor's ballocks! This damn Mill schedule makes sleepy larks of us all, willy-nilly! If we were back in Tarrytown, we'd watch the sun come up and glint off the wine bottles we'd emptied. But here, you have to be abed by nine just to rest up for the next day's drudgery." Spurwink's tone became tinged with self-pity. "And I've got an hour's walk ahead of me yet."

Hastening toward her parents, Florence called back, "Next week we play the Landfish. They're only three mills up from you."

Spurwink fell back into his gallantry. "If it were three hundred damn mills, I'd still come for you."

The desire in the man's voice made her stumble on nothing. She reached her parents still flustered, but they were too elated with the Blue Devils' victory over the Stalkers to take much notice. Charley, however, recognized enough amiss to ask her if she was feeling well.

Florence felt an immense condescending superiority toward her brother. She tousled his sweaty hair and said, "I'm fine, Charley. It's nothing you'd understand anyway."

Charley regarded her quizzically. For one brief moment his eyes widened, and she was convinced he knew. Then he turned away wordlessly and mounted into the bed of the wagon for home. Ridiculous, she thought, to imagine such a thing. . . .

And the third time she and Spurwink had met—that time was now.

Spurwink's left hand still plumped her right breast. The soft fabric of her camisole felt stiff as burlap on that nipple, so sensitive was it. His mouth ringed the summit of her other breast. His right hand was on her belly, stroking it in circles that grew wider and wider, like the ripples cast from a stone thrown into one of the Mill's many holding ponds. She felt as if her belly was filled with hot coals, like a bedwarming pan on a winter's night. Eventually Spurwink's lower hand strayed deliberately beneath the waistband of her skirts. More cunning and experienced this time in the fashions of the Valley, it quickly found the ribbon that upheld her petticoats.

Florence started, and laid a hand atop Spurwink's cloth-covered one.

"Do you really want to stop now, Pretty Puss?" he whispered, relinquishing her breast, yet with his breath still hot upon it. "Tell the truth now."

"I . . . I don't know."

"Well, you must realize I don't. Not with a Factor's Paradise so near for both of us."

"Then—do what you will. . . ."

He tugged the knot apart. Then, with both hands beneath her clothes, he pushed her single undergarment down, his smooth hands sliding over her rump and hips. The cloth fell from beneath her skirts to lie with the generations of dry dead dusty leaves, a presage of the autumn to come, so seemingly impossible at summer's height.

Without being told, she stepped out of her knickers.

Florence lost a moment then. The next thing she knew she lay on her back on the ground, her skirts pooled around her, Spurwink's muscled weight atop her, his mass centered below her waist. It took a moment for a strange sensation to register. Spurwink had removed his wool trousers and was now bare also.

"I think you'll like this, my poppet."

Florence faltered. "I want . . . I want . . ." What did she want? In the end she could not say, and lamely concluded, "I want to."

"And you will, you will. . . ."

When it was over Spurwink fell asleep for a minute or two on the duffy turf. Florence lay awake staring up into the branches of the dusty-miller tree. Judging by the roar of the crowd, the ball game was reaching some kind of climax. She put both hands between her legs and closed her wet thighs on them. What had she done? She could not feel sad about it, but neither did she feel ecstatic. The moment's brief rapture had vanished, elusive as morning mist on the Swolebourne, whose waters seemed to flow now from her center. . . .

Spurwink awoke with a startled grunt. "Oh my aching bones. What time is it? By the stars, girl, you were good! I'd fancy another ride if it weren't so late. But duty calls, and I must hie homeward." Climbing to his feet, Spurwink fumbled with his trousers in the darkness.

Florence remained on the ground. A coldness was creeping into her flesh. "When shall we meet again, Samuel?"

Spurwink replied airily. "Oh, at one game or another, I'm sure."

"That hardly seems such an enduring pledge as you were uttering earlier."

"I'm afraid it will have to do, my lass. If there's one thing I cannot abide, it's to be trussed up like one of the rocklambs in my father's abbatoir. You must take me as you find me."

Florence used the tree trunk to climb somewhat painfully to her feet. Without stopping to alter one iota of her disheveled appearance she marched out of the bower and toward the game field.

"Wait, wait," Spurwink called nervously, attempting to maintain a discreet tone. "Make yourself presentable first, girl."

Florence gave no reply, but strode steadily on.

Spurwink lost all self-assurance. "Stop, you little idiot! What do you think you're doing?"

Widening the gap between them, Florence paid no heed to Spurwink's orders. He darted a few steps after her, then thought better of it and ran off in the opposite direction.

Florence marched toward the Blue Devil and Landfish villagers, who had as yet taken no notice of her. Half of her mind was all icy cold precision and a determination not to feel anything. That was the half that showed on her face. The other part was a mix of bewilderment, pain and confusion. That was the part that huddled and mewled deep inside like a lost unweaned tarkitten.

Above her head the stars Spurwink had invoked to praise her shone with a frigid radiance. Were there truly men out there, humans who bought the luxcloth? Men like Spurwink? It seemed all too possible. Were they watching her now? Their powers were unknowable. The ten bright stars that formed the constellation Factor's Ship seemed to glare with a particular accusation.

Once she stumbled. This time, however, the cause was not excitement, but only a rodent hole hidden in the grass.

The game had ended when Florence came up to the crowd. The players were leaving the field, victors triumphant, losers consoling each other and boasting of success in the eventual rematch. The spectators had broken up into congratulatory clusters around their various relatives. Florence crossed the perimeter of torchlight and stumbled blindly into their midst, her skirts aslant across her hips, her breasts shamelessly exposed.

There was a moment of stunned silence. Then everyone was hovering about her, the men loudly blustering with outrage and moral indignation, the women all practical earnest solicitude, various children watching wide-eyed. Everyone was trying to get her to speak. Florence opened her mouth, but nothing came out. Somehow all she could focus on was the face of a little girl hanging onto her mother's skirts. Had she ever been that young herself?

Someone tossed a blanket around her shoulders, covering her nakedness. Then her parents were there. Her mother held Alan, the youngest, on her hip. She rushed up to Florence and tried to hug her. But she forgot to put Alan down, and ended up awkwardly embracing both her children. Charley was somehow beside her next. To Florence, he looked inexplicably taller than earlier in the night, as if his exertions on the field had stretched and matured him. He clutched her hand and stroked her hair. "There, Floy, there," was all he said, but somehow it was enough to start her tears flowing.

Roger Cairncross was shouting into the night, at no one and everyone. "Who knows anything about this? Speak up! Speak up, damn you!"

When he received no reply he turned to his daughter and gripped her by the shoulders. "Who did this, girl? Do you know? Are you protecting him?"

Her father's mustache was laced with spittle. His face was red as clover. Florence dropped her eyes from his. When she did this, he began to shake her back and forth with a violence that rattled her bones.

"Trollop! Tart! Is this how you were brought up? Is this what I work for from sunup to sundown? I'll have his name out of you if I have to beat it out!"

Charley was pulling his father away. The older man shrugged him violently off. Then other villagers, his coworkers, were on him, separating him from Florence.

"Can't you see she's in shock, man? She needs to get home and be cared for, not abused. Your daughter's a fine lass, she'll come round. Just give her some time."

Cairncross began to calm down. "And what of the bastard who touched her?"

"If he tries to leave the Valley, he'll give himself away, and we'll soon bag him. If he stays, a scoundrel of his type's likely to betray himself by boasting. There's no out for him. Don't you see?"

Cairncross nodded in reluctant agreement. "All right then, let's get home."

In the homeward-bound wagon Florence sat shivering in a corner, wrapped in the borrowed blanket, her

head in her mother's lap. Every few minutes the musty-smelling wainwalker pulling the vehicle would emit a plaintive bellow, as if to complain about being kept up so late. She recalled all the festive rides back to their familiar village, how she had sung and laughed with her friends. Would there ever be such days again? She began softly to sob. Why couldn't she speak? A slow anger began to smolder in her. Why should she have to speak? Couldn't they leave her alone until she had sorted everything out for herself? What right did they have to pester her with questions? The more she thought of this, the angrier she got. By the time they reached their village, Florence had ceased her sobbing. She now wore an expression of stony indifference.

The wagon stopped outside the Cairncross home. Their neighbor—a middle-aged bachelor who supported a widowed father who had grown too frail to work in the Mill—emerged from his half of the house to stare and cluck his tongue with a mixture of sympathy and reproof. Averting her face, Florence let herself be helped inside.

Once in the parlor, Florence spoke for the first time since she had left Spurwink. "I want to wash up, please."

"Well, by the Factor's grace, you've found your tongue," said her father sarcastically. "Maybe now we'll learn the cause of you bringing so much shame upon our family."

Florence said nothing, but merely went to her room. Her mother soon brought a white basin and a pitcher full of water heated on the wood stove, some towels and a washcloth. When she was alone, Florence used the chamberpot, then scrubbed herself free of Spurwink's detestable scent. She dressed in gown, robe and slippers trimmed in bluefox fur around the ankles. She knew now that she would never say anything about what had happened that night, come what may.

Back in the parlor, Florence sat on the couch, the center of her family's baffled looks. Gently at first, then more and more roughly as she refused to answer any of his questions, her father tried to elicit what had happened from her. Florence maintained her silence throughout all her father's cajoling and threats, his attempts at logic and reason, his appeals to honor, duty and affection. Her mother's pleas also she ignored. As the night wore on, Roger Cairncross grew more and more irrational. Several times he gestured as if to strike her. At last he did, bringing his open palm across her face. Florence took the blow without uttering a sound. A wild look of despair and self-disgust flashed across her father's face. He jumped to his feet and fled the house.

Charley had sat through this cross-examination silently, offering neither consolation nor accusation. Now he arose also and left.

Soon her father returned. With him was Pastor Purbeck.

Pastor Purbeck had lost an arm to the Mill's machinery at age twelve, some fifty years ago. That same year had seen the demise of Pastor Topseed's youthful catechumen, a boy named Hayflick who had fallen prey to a pack of dire wolves pushed down from their mountain fastnesses by an unusually hard winter. Young Purbeck, barely recovered from his wound and the equally traumatic surgery, had been immediately compelled by his family—a disreputable group led by a drunkard father and a termagant mother; they had shortly afterward left the Valley—to take his devotional vows. Upon the death of Pastor Topseed some ten years later, Purbeck had become the Valley's youngest cleric.

Purbeck lived now in the one-room rectory attached to the Blue Devil chapel, a building on the far side of the Mill from the Cairncross home. He was tall and thin, and bore a good-sized wen at the hinge of his jaw. His eyes fairly radiated his devotion to the religion symbolized in the icon of the Factor hung on a chain around his neck. These features, combined with his empty right sleeve, formed a presence capable of frightening even grown men. More than one poor child, hurrying through the unlit windowless tunnel through the Mill's body, rushing from one square of light to another, had had the wits startled out of him by being abruptly grabbed on the shoulder by the single hand of Pastor Purbeck and questioned on elements of his catechism.

In the homey atmosphere of the Cairncross parlor, Pastor Purbeck lost none of his imposing sternness. Florence shivered to see him, recalling no specific incident but only the general air the Pastor had always carried, an air of suspecting everyone of guilt and sin. Tonight, she feared, she merited his suspicions.

Purbeck took off his wide-brimmed cleric's hat. Then he sat on a footstool directly opposite Florence. He rested the hat on one bony knee. He flicked some luxdust from it with a contemplative slowness. He lifted the silver figure of the Factor on its chain to his lips and kissed it. Then he raised his gaze to Florence. She braced for a flood of accusations and threats of damnation.

Purbeck's voice was soft and flat. "Ah, young Florence, it seems only yesterday to me that you were being consecrated into the faith. Such a pretty little girl you were. But even then rather willful. I remember when you joined the choir. 'Why must I sing with all these others?' you asked. 'I prefer to sing alone.' I found it amusing at the time, and so I let you have a solo part that Layday. Do you remember the song, Florence? I do. It was 'Our Hearts Shine Like Lux in the Factor's Sight.' A lovely piece. Written over a hundred years ago by Holsapple. And your voice was equally lovely, dear. So sweet and piercing, such a contrast to all those massed tenors and basses. You were guaranteed a solo every Layday afterward. Such beauty, I thought, could only serve to glorify the Factor."

The Pastor paused a moment, turning his hard eyes ceilingward before fixing Florence with them again. "But now I reproach myself for my vanity, as well as for yours. For what good is beauty without the soul behind it? It is like putting stucco on the Mill. Underneath would still be the brick. And when the heats of summer and the chills of winter—the trials of life, if you will—had flaked all the plaster off, the brick would once more be exposed. Yet my analogy is imperfect. In the case of the Mill, we would not be ashamed to see the noble, homely brick, the true substance of our days. But in your

case, my dear, we are all of us ashamed to see what lies beneath your lovely exterior."

Now the Pastor's voice began to modulate into those tones it assumed just prior to the inevitable moment when he would bring his single fist down on the pulpit. "Your beautiful exterior, my dear, is cracking. You have let it be mishandled and mauled, and now your soul is starting to show through. And what a sorry sight it is! Its lineaments are those of greed, selfishness, impetuosity, and stubbornness. You have revealed yourself to lack a sense of gratitude to your parents, of duty to your village, of devotion to the Factor. You have revealed yourself to be a thoughtless, reckless, immature little girl. And to compound your errors, you refuse now even to make amends for your sin by disclosing the name of your partner."

Leaning forward, Purbeck took hold of one of Florence's hands. She tried not to flinch, but failed to repress a slight movement. The Pastor did not comment on this, but instead launched onto a different tack.

"Do you think, my dear, that your partner will turn himself in and save you performing what you wrongly regard as a betrayal? If so, you must disabuse yourself of such a notion immediately. Although it pains me to say it, there are few men in this Valley who would move a little finger to save a woman's virtue. But that is the sad fact of a male's composition. That is why a man is bound by natural law to support his family—if he is lucky enough to have one—by the sweat of his brow all his days. That is why the Factor made a disproportionate number of men. They are expendable and imperfect.

"But woman, dear Florence; woman is different. They are so few and so rare that their natures cannot help but be more refined and heavenly. It is woman who perpetuates our race on this sad world. When a girl child is born—so rarely, only one to every two boys—we rejoice. All her youth she is cosseted and petted, perhaps made too much of. But we cannot help it, for we see in her a visible sign of the Factor's grace, proof that although he has made life hard, he has not made it impossible. It is woman who must act as the conscience of our race, the moral light. So you see, all the burden of resolving this affair must devolve to you."

Florence's mother was crying; her father was tugging thoughtfully at one end of his mustache and nodding, as if to acknowledge his own male unworthiness. Pastor Purbeck gave her hand an extra squeeze and eyed her hopefully. Florence looked at all of them in disbelief. Then she yanked her hand away and shot to her feet.

"I won't have it! I won't be part of it, do you hear! Special! Holy! Duty and honor! That's all I've heard all my life! Why, I'd rather work in the Mill twenty-four hours a day than spend one minute as the kind of creature you paint. But you won't have a woman in there. 'Too dangerous, too coarse,' you say. 'Stay home and have babies, lots and lots of babies!' For what? So that they can live out their tiny constricted lives in this narrow Valley, bowing and scraping before the Factor? Why should I raise more little slaves for him? Ask my father's opinion of the Factor, if you want to hear something that makes sense. No—I'll go to my grave unwed, I swear it!"

Pastor Purbeck dropped to his knees, crushing his hat in the process. "This is close to blasphemy, girl. Much worse than mere fornication. I am going to pray for your soul now. Let those who would join me."

Florence's mother got down on the floor, then Roger Cairncross too, more reluctantly. They were bowing their heads when Charley came in.

"Get up," he said. "Get up, all of you. There's no need of that. I've known all along who the man was, and now that I've had time to think, I've decided to tell."

Florence yelled, "Don't listen to him! He's lying! There's no way he could know."

Charley regarded his sister somberly. "It was his scent, Floy. I smelled it on the playing field when I tackled him, and on you tonight. It's that new clodder, Spurwink, Da. From the Tarcats."

Roger Cairncross leapt up. "The Devils and I will fetch him. Keep our girl here."

Florence threw herself on Charley, knocking him down. She rained blows on his head and shoulders, shrieking, "I hate you, I hate you, I hate you! You awful, hateful prig! You and your stinking Mill can burn!"

Charley made no motion to protect himself. Eventually Florence's rage subsided, and she crawled back to the couch. Charley raised himself off the floor. Tears washed tracks through the blood from his nose.

Spurwink was not much more bloody than Charley when they marched him into the house. One eye was swelling, and he favored one leg. Florence had feared worse. His demeanor was subdued, but still somewhat insouciant.

"Since they tell me we are to be wed soon, I might as well salve my pride and ask if you'll have me. Well, poppet, what shall it be? Pretend you have a choice and answer me now. Will you be my wife?"

Florence was exhausted. She had no reserves left. A vista onto her future opened up to her: cooking, birthing, her biggest challenge being keeping household accounts. She regarded her mother: a fine woman who loved her. Was it right to disdain the fate they and all Valley women shared?

"I am yours," she said wearily.

Spurwink grinned, thinking it was he she addressed.

But Pastor Purbeck, having caught Florence's eyes with his, knew it was himself she was capitulating to. Or rather, the Valley, the Mill, the Factor.

3

The bulky man chafed his hands in an abstracted way. For several minutes he merely sat, rubbing those large hands together, squeezing first one then the other. At the end of this period he abruptly ceased all motion, his hands freezing into position. His conscious mind had caught his limbs again at their independent life. An expression of distaste flickered across his features. He jerked his hands and they flew apart as if they were similar poles of a lodestone. He placed them carefully

down on the desk in front of him, palms flat on the felt blotter.

What made his hands betray him? Anxiety? Most likely. He had so much on his mind. His mill, the Factor's upcoming visit, Alan's strange behavior of late. . . . Yet why look for such deep-seated motivations? Perhaps it was only the chill. An unconscious seeking of warmth? His breath did not fog, but felt as if it should. And well it might, were the potbellied stove in the corner, sitting four-pawed on its raised hearth of green-enameled tiles, to slacken its output any further. Yes, that was probably it. Just a basic animal instinct, nothing complicated about it. . . .

The man leaned back in his chair and regarded his traitorous hands. They were big-knuckled and hairy. The wiry hair disappeared at his wrists beneath the cuffs of his jacket. The hair was still black on his hands, but the short-cut stubble carpeting the enigmatic lumpy contours of his skull was mostly grey. His eyes were dark, his nose showed signs of having been broken more than once, as did so many ballplayers' noses—although those days were long behind him—and his jaw was blunt and perpetually outthrust.

Old. He was getting too old for this job. How many more years could he cling to this position? Just as long as he earned a good share of the Factor's largess for his mill. But how long would that be? Long enough to train his protégé and insure his accession, he hoped. Factor grant him that much, he prayed.

The room, the man suddenly realized, felt chillier than just a minute ago. Looking up from the plain scratched woodgrained surface of his desk beyond the blotter—across which were scattered pasteboard rectangles punched with holes and scribbled with figures, through which were threaded hanks of shining luminous threads of various subtle hues and intensities—he spotted the stovetender asleep, something he had not registered with his earlier glance.

The boy wore a red coat with brass buttons which he put on each morning from his wooden locker among the others just inside the Mill doors. This was the badge of the stoveboys—those who formed, along with the stockboys, the least skilled of Mill workers. The boy sat on a short three-legged stool beside the sooty coal stove that was rapidly cooling. His chin hung on his chest, his eyes were closed, and his breath buzzed in and out as if he were acting the part of a diligent bellows.

The man regarded the boy with a mixture of good-humored solicitous pity and mild aggravation. He knew how hard it was for these youths—coming into the Mill at age twelve, having known mostly freedom and few responsibilities—to be burdened with one of the most important tasks in the Mill, that of guarding and ministering to and always watching the contained fires that heated the Mill during the winter, and which must never be allowed to escape. Also, it was no easy physical task, constantly hauling scuttles of coal up the long flights of stairs.

On the other hand, these boys were now workers. They were getting paid, drawing a share of credit from the commonly held gold which derived from the Factor's purchase of their cloth each year. These boys had to learn proper work habits early on, if they were ever to be relied upon to intelligently manage the various machines that all contributed toward producing the luxcloth.

And the luxcloth—that unbelievably splendid and gorgeously unique product of this humble uncharted world drifting forgotten and unknown and nameless amid the welter of Factor-visited suns—the luxcloth was everything.

The luxcloth was his life.

Preparing to rise and shake the boy awake and at the same time administer a severe upbraiding, the man paused. Something about the boy struck him as familiar. Naturally there was a surface identicalness in the incident to many others. He had overseen the initial development of more than half a hundred such boys in his career as Master Luminary, and it was only natural that many of them would more than once be caught napping. But there was something about this lad that tugged more acutely at the strings of his memory. Something about his face. . . .

Of course.

The boy resembled Charley.

The man's thoughts fled back down a tunnel whose ribbed walls were years.

Charley had entered the Mill in the summer. That meant that he had gone directly to the stockroom, that cavernous brick and timber hall—its high rafters plainly visible, unlike the other dusky chambers of the Mill—where the luxcloth was stored, a cathedral of radiance where the glow was so intense that the stockboys must wear smoked-glass goggles as they worked.

The man had not particularly noticed the new boy then, having the whole production of his mill to keep in mind. In the winter, a quarter of the boys had been shifted immediately to stovetender duties. (The other three quarters would be rotated out of the stockroom in turn, in order to save their eyesight, as the long cold months went on.) Charley had been one of the first transfers, and he had ended up in the man's office, sitting right where the current boy now sat dozing. The man's hair had been less grey then, and the little stool had had fewer initials carved into it. But aside from that, the situation had been identical.

Something about Charley had attracted the man's close attention. A ceaseless curiosity and darting focus that played about the boy's placidly intelligent features seemed to resonate with something inside the man himself. He made a mental note—along with all the other memoranda regarding the seemingly endless details of his mill—to keep an eye on this boy for future use.

And when Charley's stint as stovetender was supposed to end, along with the old year, the man retained him by fiat in the office, denying three other faceless boys their turns, and perhaps causing some slight incremental damage to their vision as they continued to labor in the stockroom the whole winter.

This small harm he tried to forget, striving to convince himself that the good inherent in his actions outweighed

the bad. His life was a patchwork quilt of such ethical tradeoffs and judgements. And the quilt frequently scratched his conscience.

Busy years attached themselves like ambulatory Pagan Sea coral to the edifice of the man's life. Always, among his overt duties, he took a covert interest in the progress of young Cairncross. After Charley was promoted from stovetender, the man watched him move from the gillboxes to the spinning frames, from the winders to the converters, always exhibiting a deft proficiency and keen understanding of each step in the intricate process of fabricating luxcloth. The man noted with quiet pleasure the quality of the work which the young man—for by now he was no longer a boy—turned out. After a while, the man felt he knew Charley's secret soul and essence, how it was bound up into the luxcloth's very weave, as was his own.

The only thing the man could never figure out was how such a progeny could spring from the loins of a soured old agitator like the elder Cairncross. That man was a bad egg. And to have also engendered another son such as Alan, so different from both Charley and the old man—The mechanics of destiny were hidden from mortal sight. Perhaps the Factor could explain it.

But one might as well hope for the secret of the Factor's immortality.

The cranky misanthropism of the elder Cairncross, however, was not what the seated man wanted to ponder, and he put it off as ultimately inexplicable. He wanted to consider Charley some more, to recall more of their twenty years of association. Such daydreaming was certainly allowable from time to time, as long as one did not overindulge.

Finally, after nearly a decade of observation, the day came when the Master Luminary approached Charley on an errand he, the Master, had never before performed. Charley was a foreman by this time, supervising a score of workers, among whom was his own father, who had never gone further than machine-tender, a post whose duties were changing gears and oiling bearings.

Out on the twilit floor, where the only illumination came from the dancing threads running through the machines like liquid moonlight and from the refulgent yarn on cones and bobbins piled high in handtrucks, and where the noise of the leather belts and the pulleys and the gears—all powered off the Swolebourne—was enough to shatter concentration, the Master found Charley supervising the changing of the worn rollers on an idled machine.

"Cairncross," the man said. "Leave this now and come with me."

"Yes, Master Otterness," Charley replied.

They walked across the width of the mill and up a flight of stairs to the third and topmost floor, all the while silent. In the anteroom to Otterness's own office, the Master Luminary indicated with a wave a tall spidery clerk's workbench and accompanying high railbacked chair.

"You will sit here," said Otterness. "Begin studying the sample cards that chart the standard luminances. Start with the Whaleford set. They're the classic gauges from which all others derive. I doubt if you will get much beyond those today."

"Yes, sir."

Otterness turned to enter his own office, heard Charley cough, and swiveled back.

Charley's face wore a look of hurt disappointment. "Sir, may I ask why I've been relieved of my former duties? I hope I have not disappointed you with inferior production."

"To the contrary. Your work has been exemplary. The best I've ever seen. That is why I am now nominating you as Apprentice Luminary for this mill. I believe you have the talent for such a post, and understand the grave responsibilities involved. On the rightness of our luminance choices and the resulting attractiveness of the cloth, the whole material well-being of the Blue Devil village rests. I trust you will repay my faith in you, and let neither me nor the mill nor the village down."

Charley bowed his head for a moment. When he lifted it, light from the oil lamp glinted in his tears. "I will, sir. I will. I mean, I won't. Let you down, that is."

Otterness suppressed a smile. "Very well."

Now he came back to himself in his office. The stoveboy still slept. Otterness considered the scullion's dreaming features. He knew he would never have occasion to choose another apprentice. He would die in his job, or be dismissed by a committee of his peers from the other mills if his performance became senilely awful, whereupon in both instances Charley would become Master, with the consequent right to select his own apprentice. But the fact that Otterness was not always on the outlook for talent anymore did not mean that he could risk alienating the skilled. Who was to say what role this snoozing boy would possibly play in the future? The mill—and the Mill—needed all the competent hands it could get. His unnecessarily brusque reprimand here could have unforeseen consequences years down the line. No, better to handle the lapse—after all, it was only the boy's first—in a subtler manner.

Otterness deliberately pushed back his chair with a loud scraping noise, his face averted from the stoveboy. He had the satisfaction of hearing the regular breathing suddenly stop in a panicked reaction, then the noise of the boy's booted feet as he stood up and the clunk of the stove door opening and the chunky rattle as he began scooping coal into the stove.

Getting to his own feet, Otterness turned on the boy —who was drowsily rubbing his eyes with one hand while dishing out coal with the other—and said (pausing a moment while he recalled the boy's name), "Pickering, have that stove good and hot by the time I get back, if you please."

Now furiously tossing coal with a two-handed motion, little Pickering said, "Yes, sir! Of course, sir! Before you return, sir!"

Otterness stepped outside his office. The anteroom was empty. He knew Charley was out somewhere on the millfloor, among the turbulent, clattering, endlessly breaking-down machines, watching and directing the myriad workers who strove to reify the newest type of

shining cloth which he and Charley envisioned and sometimes it seemed actually dreamed into possibility, after much contemplation and discussion of possible blendings. Having something vital he must discuss with Charley—the original object of the intense pondering that had allowed him to let Pickering fall into a doze and his own hands to escape—Otterness set out to find his assistant.

Leaving the relatively quiet anteroom—whose thick paneled walls, bearing sconced oil lamps, served to mute the continuous roar of the machinery—was like plunging into a surf of shadow and sound and odor. Pausing while his eyes adjusted to the silvery gloom, Otterness drank in the glorious chaos from which his beloved luxcloth emerged.

The Mill had no lighting except in its offices. All its other operations were conducted in the ethereal glow of its product. The luxfibers, in their various unfinished forms such as raw combed tops or spun threads, had to be protected from sunlight or artificial radiance, and so all activities in the Mill took place in a diffuse illumination that amounted to the light one might encounter when both moons were full. This illumination had to suffice. There was no alternative without ruining the product. The reason lay in the very nature of the lux.

Lux was a common plant, native and unique to this world, easy to cultivate and harvest. In the daytime it was an inconspicuous crop: tall waving fronds of a silvery green with tough fibers visible just inside its translucent stalks. But at night—at night it could be seen to glow. With the sun's competition gone, the lux visibly reradiated stored sunlight. At least this was the most commonly accepted theory. No one—save perhaps the Factor, and he was unapproachable on such matters—could quite agree on the reason for the lux's remarkable properties. A rival to the sunlight theory was that the lux absorbed certain glowing minerals from the soil, which, becoming part and parcel of its very being, allowed it to continue shining even after being chopped down and processed in a dozen different ways, shattered and pulled and twisted and recombined.

Whatever the true explanation, one fact was certain: continued exposure to any light above a certain threshold after the lux was harvested would drastically affect its desirable qualities in an unpredictable fashion. Thus the lux led a most secretive afterdeath existence, like some noble god fated to an underworld imprisonment. Hurriedly reaped and crammed into cunningly crafted barrels in the fields under starlight, it was loaded onto wagons which were then covered by canvas tarpaulins as further insurance. These wagons were kept indoors by day and traveled only at night. Still a faint luminance came from them, revealing that all the best precautions could not insure a light-tight seal.

Once arrived at the Mill, the lux plunged into the massive building's lightless depths, never to emerge until it had undergone a final wet chemical finishing that fixed the radiance once and for all. The luxcloth, then, could be exposed to daylight without ruining its miraculous qualities.

(Otterness silently praised the Factor's genius, which had provided the recipe for this miraculous fixative, without which all their hard work would be useless.)

The fact that there were different kinds of lux was the simple pivot that made Otterness and his peers the most important men in the Mill, and which allowed competition between mills to exist. Had there been only one kind of lux, all would have been simple. Only a single variety of cloth could have been produced, and the Factor would have bought equally from all sixteen mills. But every region where lux was produced experienced different conditions: soil, sunlight, clouds, precipitation, all contributing toward the individual qualities of a region's lux. Some shone with an opal whiteness. Another kind might exhibit a diamond purity. A third was nearly blue, a fourth celery green, a fifth amethyst, another the faintest of yellows.

Within hundreds of miles of the Mill, there were as many different types of lux produced. From all quarters they funneled into the unduplicated manufactory that was the Mill. The dishwater-colored harvest from Teaford; the ale-colored harvest from Claypool; the silver harvest from Goldenfish; the lilac harvest from Albion Cay; the ginger harvest from Clinkscales; the pewter harvest from Yellow Hedges; the pinkish harvest from Fireflats; the champagne harvest from Shining Rock—each with its gradations of luminance also. The number of blends was astronomical.

There were well over a hundred known luminances. Whaleford, Emberstone, Sleet, Silent Sea Wine . . . The catalogue went on and on. A Master Luminary had to be able to instantly recognize each kind without error, so as to spot inadvertent mixes caused by the inattention of workers and stop them before they got too far into production. Moreover, the Master Luminary had to know all the standard blendings, and also those poor choices which resulted in muddy or eye-shattering fabric. On top of all this, the Master Luminary had to be a creative experimenter, developing his hunches about what new blends would turn out to be marketable, thus securing one's mill an inordinate share of the Factor's patronage. (And even after four centuries of trial and error, all the blends were not known.)

Additionally, the Masters engaged in bidding wars for each region's crops. They had to be skillful traders as well as perceptive visionaries.

In short, the fortunes of a mill and its village, the day-to-day standard of living of its families, rose and fell with the Master Luminary's skillful or clumsy decisions.

Otterness was a fine and expert Master. He knew Charley had the potential to be better than he. It felt good to think of the mill being left after his death to such a successor.

But first, Otterness reminded himself, we must get past this latest obstacle.

Moving off in search of Charley, Otterness savored the noisy clatter of the belt-driven machines that marched in ranks down the unbroken length of this millsection, and inhaled the ripe smell of the vegetable oil used to lubricate them. He could sense in his bloodstream the har-

nessed and dedicated power of the Swolebourne far down beneath the Mill, where its constricted currents turned the great wheels that transmitted their power via an intricate system of gears and shafts throughout the building.

Otterness took the time then to issue a brief prayer for heavy snows, so that during spring and summer the Swolebourne would rush even more mightily and much work could be accomplished in a last burst before the Factor arrived in the autumn.

Down in weaving Otterness found Charley watching the warpers thread a loom with a warp of Sleet Nine, which had a tendency to break easily. Here was virtual silence. The looms were the only unpowered machines in the Mill, the process being too delicate and complicated to automate, and much skill being required in the casting of the shuttle and the beating of the woof. No one had ever been able to devise mechanical substitutes for the human weaver's hand and eye, and Otterness was confident no one ever would. At times, he regarded the looms as a bottleneck in the production process, but always quickly reminded himself that the old ways that had persisted for centuries were undoubtedly the best. If the looms ever could be automated, the quality of the work would probably plunge, and where would the mill and its workers, not to mention Otterness's reputation, be then?

"Charley," called Otterness above the staccato clicking of the myriad flying shuttles, "I need to see you."

Charley gave a final pointer to the warpers and came up to Otterness. "Yes, sir. What's on your mind?"

"I prefer not to discuss it here, son. Let's walk out on the floor."

Charley nodded, and they left the weaveroom, exiting into twisting. Boys trundled noisy wooden-wheeled handtrucks past them, moving yarn from one part of the mill to another. Otterness thought passingly about all the myriad skills needed to keep the Mill going: carpenters, masons, engineers, machinists, beltwrights, oilers, stoveboys. . . . Sometimes it amazed him that such a complicated extravagant delicate assemblage of people and machines could function for even a single day.

"Charley," announced Otterness after they had walked a few yards, "I've decided. We're going to devote a full fourth of our production after the Factor leaves this fall to the new Idlenorth and Palefire blend."

Charley stopped in mid-step and turned to face Otterness. "But, sir—the Idlenorth is a brand-new breed. We're not even assured yet of steady supply. What if the growers have a bad year? And the Palefire—my God, that's one of the trickiest yarns to spin. I know the sample of the blend we ran off was breathtaking. But a quarter of our output—sir, I just don't—"

Otterness held up a palm toward Charley to stop the torrent of speech. "I have considered all these issues and others you might not even have stumbled upon for months. I do not say this to boast, but merely to reassure you that I do not plunge into this without adequate forethought. But it is our only recourse. I do not blame you for not immediately coming to the same conclusion. You are missing part of the equation, one vital fact that forces our hand."

Otterness resumed walking down the aisle dusted with lint that ran between the twisting machines. Workers looked up with momentary interest, then quickly turned back to their demanding tasks. For a moment, shining motes of lux hovered around his head in a chance-formed halo and Charley regarded him with more than a little awe evident on his face. Quickly catching up to the Master Luminary, Charley waited for him to explain.

Instead, Otterness asked a question. "How long have you been working in the Mill, Charley?"

"Why, nearly twenty years, sir."

Otterness nodded sagely. "You confirm my own memories, which I sometimes doubt. In that case, then, you were probably too young to really notice the lean years we passed through right about then, when the Tarcats started production."

The naming of the sixteenth mill seemed to trigger some sudden flood of remembrance in Charley, for his face grew distant. "I remember . . . I remember that period well. And now that you mention it, I do recall some talk about how the new mill would affect us all. But I don't really remember tough times, no. Always enough food on the table, new clothes when needed . . ."

"I take that as a compliment to the way I handled the challenge," said Otterness. "The Tarcats were diligent and inventive. Their workers had a hungry desire to establish themselves, which we complacent older mills sometimes lose. Three years after the Tarcats started up, they earned ten percent of the Factor's gold. All other mills earned correspondingly less—some much less, some not so much. And when the dust settled, some of those mills—you can probably name them if you think about it—never recovered their former status. Of course, the Factor compensated somewhat, by buying overall a slightly greater quantity of cloth than before, but not enough to make up for the new mill's total production. It was as if . . . I don't know. As if he were encouraging competition for competition's sake. Perhaps his buyers grow jaded, and this is the Factor's method of shaking us up and producing new, more exotic goods."

Charley remained silent, and it seemed he was trying to digest all this new and startling information—or rather, this new perspective on old events. Otterness lowered his voice, and Charley had to strain to hear his next words.

"What I am about to tell you must not be bruited about. The common folk will discover it soon enough anyway. This fall, the Factor is going to bid us start construction on another new mill. He warned us Luminaries last year."

Charley drew in his breath sharply. Otterness grabbed his arm. "I'm not going to be caught flatfooted this time, any more than the last. I know the new mill won't come on line for many years. Still, it's none too early to experiment with new blends. If we can grab the Factor's attention now, we'll be more likely to hold it during the rough years. Do you see, Charley? Do you see what we must do?" Charley regarded the blunt-faced man with a

direct and serious gaze that locked their visages—young and old—into a composite like those illusory drawings of vases that suddenly transform beneath one's attention into two profiles. "I do, Master Otterness. Roland, I do."

A wash of affection swept through Otterness at Charley's use of his first name. How different it sounded out of his mouth than off Alan's lips of late. . . .

"Now, secrecy is paramount regarding this decision, Charley. You and I are the only ones who know of this. Were the other mills to discover our plans, we would lose all advantage. I do not want this to turn into another debacle like the Sandcrab mess. How the other Luminaries ever discovered our schemes for that mix, I still cannot say."

"Nor no more I," interjected Charley hurriedly.

"I'm not blaming you, son. Too many wagging tongues knew about that strategy. The tattler could have been any of a dozen, in whose numbers you're definitely not included. But I'm just speaking aloud my own fears."

Charley nodded in understanding.

Otterness clapped a hand on Charley's shoulder then, saying, "But enough of such dire talk, son. We'll be discussing this issue oft enough in the years to come. Let's speak of more pleasant things. How are your wife and son lately?"

Libby Straw, from the Swift Sparrow village, a member of one of the Valley's oldest families, had become Charley's bride five years ago, and had come to live in the Blue Devil village.

"Fine, sir," replied Charley, though he still seemed ruminative. "Both healthy and fit, the one still beautiful and the other still a red-faced squawler."

"And your mother and sister?"

"Also hale. Floy I saw just last week, when she came over from the Tarcats for the quilting bee."

"She is happy there, then?"

"Yes, although even after all these years she still misses Blue Devil ways at times."

"It was a shame, the way she was plunged headlong into that match. Your father was never the same after it. But I'm glad to hear she's matured into it."

"Oh, she has. She even deigns to speak to me now."

The men shared a chuckle then at the folly of women. They walked on unspeaking, leaving twisting for doubling. After a time, Otterness broke the silence, rather timorously for one usually so confident.

"And your brother Alan—does he ever speak confidentially to you about his feelings toward me?"

Charley looked gloomy. "Alan keeps his own counsel, I'm afraid. Mother continues to coddle him, and his lack of a job has not improved his character. His weak heart is indeed a heavy burden, and I understand why he's been prohibited from the Mill—the stress of being on his feet all day working would surely kill him—but I think he's come to use his health problems as a general excuse to get his way. No, sir, I cannot report anything on Alan's inner thoughts."

Otterness tried to put some unfelt joviality into his voice. "So be it. I'll have to muddle along on my own with the young rascal."

The men reached the rear lamplit staircase and began to climb. Charley spoke.

"Sir, might there not be another way to improve production, in order to meet the new competition? I am thinking of certain modifications in the machinery, and perhaps even in our method of power. I have heard Tarrytown rumors about steam—"

Otterness recoiled visibly. To hear such talk from his protégé was perhaps the most disturbing thing that could have happened at this crucial juncture in the mill's existence. He wondered suddenly if young Cairncross could have inherited any of his father's wild-eyed cynicism. Best to probe gently around the roots of this heresy and then yank it up for good.

"What you are advocating, Charley," Otterness said slowly, "is the first step on a very slippery slope. If we begin to tamper with our time-honored methods of production—which the Factor has endorsed implicitly by his continued visits—then we risk all. Consider the upheaval in Mill hierarchies and procedures which new devices would bring, not to mention the radical alterations in village life. Do you wish to precipitate such things?"

Charley said nothing for a minute, then said—with what Otterness took for sincere conviction—"No, sir. No, I do not. Please forget I ever proposed such a foolish step."

"It's not your father who's filling your head with such ideas, is it? I know he's been especially bitter since the probation incident."

Charley leapt to his father's defense. "No, sir, he's not been preaching those things anymore. And as for the probation—he admits that losing two month's work was only fair for what he did. I don't know what came over him, sir, actually to light his pipe in the Mill. God, I like my smokeweed as much as the next man, but to think of what could happen in this oil-soaked warren if a single spark should land in the wrong place—he's promised me personally never to do such a thing again, sir. He was only tired and unthinking, is what it was."

Otterness softened his tone. "I understand, Charley. We all make mistakes. I have nothing personal against your father, you understand. It's only that occasionally . . . Well, you know what I mean."

"It's all right, sir. No offense taken. You've got the welfare of the whole mill at heart, I know."

Otterness felt relieved. "That's just it, Charley. We're all only partially cognizant of the real nature of things, you know. And I feel that my perception of reality is just a little more valid and complete than your father's. It's the big view, Charley, that you and I share. That is why the workers trust us to guide the affairs of the mill. And that's also why we can't seek after new ways, Charley. Because we don't know enough. Don't you think that the Factor—with his vastly superior knowledge—couldn't lift us up out of our traditions if he chose? But since he doesn't so choose, then we must have the best life we're fit for. It all comes down to trust in the end. Either we trust the Factor's decisions, and the workers trust ours, or everything collapses."

"I see," said Charley.

Otterness thought of a last image to persuade Charley, one that he frequently resorted to when doubtful himself. "We're all just bricks, Charley. Just bricks in the Mill. And we can have no greater idea of the whole grand plan than a brick has of the immensity it forms a part of."

Charley seemed struck by some personal resonance in Otterness's trope. "Just bricks," he muttered. "Just bricks." When they reached the office again, Pickering had it cozily hot. Dismissing the stoveboy to insure absolute secrecy, the Master Luminary and his Apprentice set about outlining the transition to the new blend. The hours passed in intense absorption for the two men. The final bell tolled, sending all the regular workers home, and still the pair toiled on. At last, closer to midnight than to sunset, they broke up their labor for the evening.

Outside the Mill they walked together across the crunchy snowfield, silent in their individual thoughts. Among the quiet snow-shrouded houses they parted, Charley to join his family, Otterness to greet an empty home.

Looking up for the first time only when he stood on the stoop of his house, Otterness was startled to see a light on inside his rooms. With his heart pounding, he opened the unlocked door and stepped inside.

Alan Cairncross was a slim young man with blond hair and thin lips. At age twenty-five, he still had hardly any cause to shave daily. Unadept at ball games, he excelled at the annual spring morris dances. Even walking through the village, he carried himself with unusual grace. Slouched now in Otterness's favorite chair, he retained this allure.

Otterness's mouth was dry. Memories rose to plague him. The first time he had seen Alan, at a dinner at Charley's house, some six years ago. Summer nights spent lying together outdoors on the meadowed Valley slopes. Winter nights like this one by a roaring fire. Old. He was getting too old. Old men had too many memories.

"Alan, it's so good to see you again. Will you have a drink? I could easily mull some ale. . . ."

Alan straightened up. "No, thank you, Roland. I'm not here to stay the night. I just wanted to talk a bit. How is everything with you? How's work?"

Seating himself across from Alan, Otterness found himself beginning to babble like an adolescent. Alan listened attentively. Then, for some reason, he reached out to grab Otterness's hand. The Master responded by squeezing the other's upper thigh.

"Roland, stop. I cannot continue with this deception."

Otterness's heart crumbled inside him, like a brick powdered by a sledgehammer. In a blinding instant he knew what Alan was about to say. But he had to hear it from the young man himself. "What . . . what do you mean?"

"For the last two years I've been a spy, a serpent in your bosom. The Scorpions have paid me handsomely to learn of your plans in advance. Actually, it was not them alone. Others too. That's why I've been so cool to you lately. I've hated myself every moment we've been together. I can't stand it any longer. I've come to say goodbye."

Otterness surprised his hands together again, rubbing, squeezing. Alan's neck was so thin. . . .

He forced them apart. Maybe if he had blurted out the latest scheme. But he had not. Thank the Factor for small favors, however ironic.

"Why?" he managed to ask.

Alan shrugged. "I could say it was the money. That was what I thought at first myself. But I realize now that it was because you loved the mill more than you loved me."

Otterness tried to deny he charge. But he could not.

"And you could never reconcile yourself to that status, if it had to be?"

"How can my answer matter, after what I've done?"

"Just tell me."

"I . . . I don't know. I could try to understand."

Otterness put both hands on Alan's thighs. How much better they felt there than around his throat.

"Then just try. That's all I ask."

Alan's eyes widened in astonishment. "That's all?"

Otterness smiled. "And why not? That's all life asks."

4

Seen from three miles high, the autumnal Valley was an abstract composition illustrating the beauty of pure geometry and color. By far the greater part of the Valley was a mass of brilliant fiery foliage: from both ridgetops, down almost to the outhouses that were the structures most distal from the Mill, was spread a carpet of orange and red and yellow tree-crowns threaded with green, like a bed of inextinguishable coals salted with minerals.

Bracketed by the trees were the Mill and the dwellings of the workers. The Mill's slate roof stretched straight down the Valley's length, a fat grey line that swallowed a skinnier silver-blue and rippling turbulent one at the north and disgorged it at the south. The clustered houses, each village separated from the others on its side by sere brown fields, punctuated the exclamation mark that was the Mill like bisected umlauts somehow gone astray from their vowels, the punctual Mill and its outliers as a whole signifying the exclamatory pronunciation of some obscure but vital word.

Beyond the Valley could be dimly apprehended other settlements. Of course, under further magnification they could be resolved to any required depth.

The Factor, regarding the aerial view on the screens of his titanic spherical ship now hovering directly above the Mill, thought—insofar as he was capable of appreciation—that it was a rather esthetically pleasing vista.

He was glad that he had gotten a chance to come here at last. As with all places in this miraculous universe, it was a sight worth seeing in and of itself. But it took on special meaning when one considered the remarkable product that was produced here and only here, in this archaic and timelost Valley. From what he had heard, he had quite a reception in store when he set foot below to redeem the goods that had been stockpiled all year

against his coming. He couldn't know for sure, of course, until he jacked in, never having been here before.

It was time now, he supposed, for that particular pre-contact necessity. Yet for a moment the Factor hesitated. He was unwontedly sentimental today, outside all his parameters. He supposed it stemmed from the fact that he was visiting this world for the first time in his long and limitless lifespan. His yearly round of planetary visits normally took him only to worlds he had been to at least once before. His coming here was a newness to be savored, arising from the rare disappearance elsewhere of the Factorial ship previously assigned here. The next time he visited this world, it would be as one returning to the familiar. There would be no exciting thrill of the heretofore unseen to add a touch of spice to his unvarying and solitary life. And although the Factor had been designed to tolerate a degree of boredom and regularity which would have driven a human insane, he still found newness a thing not unwelcome in small doses.

So for a few minutes the Factor merely reclined in his chair and studied the view offered on his remote-panels. When he had drunk his fill of these visual stimuli, he reached with both hands up and behind his padded headrest, grasping a node-studded wire cage which he swung up on its arm until it rested securely atop his skull.

Then he jacked in.

When he arose a second later, he knew the history of this world. Not dating from its initial settlement by humans, of course. Those records were long ago vanished, destroyed or mislaid when the Concordance disintegrated in a galaxywide psychic calamity, or evolutionary leap. No, the history that the Factor had so effortlessly internalized began after the Inwardness, when the Factors had been created, almost as an afterthought, to partially resume a role that most of humankind had abandoned. Interstellar travel no longer appealed to those human societies capable of it. Integrating themselves into the Bohmian implicate order that underlay external reality, they had moved on to other, less visible concerns. Still, those who had turned Inward had not wholly severed themselves from their primitive cousins elsewhere, the mental Neanderthals who had failed to make the transition, and continued to maintain an obscure and manipulative concern with information and products from other worlds.

Not that those who had turned Inward could really use material goods as they once used to.

The Factors now obediently and disinterestedly served to link, in an almost gratuitous fashion, the scattered and devolved human communities around the galaxy which had not turned Inward. The Factors had discovered—or rediscovered—this world over four centuries ago. They had fastened on one product as being of interest to their human motivators. They had encouraged the production of the luxcloth in the manner that seemed best to their semiautonomous intellects, stimulating competition and diversity every generation or so by ordering a new mill complex to be constructed. Elaborate rituals had evolved around the visit of a Factor—which ceremonies were not discouraged, contributing as they did toward respect and compliance.

And now the cycle had come round again. It was time for the Factor to initiate the familiar exchange which he had never actually participated in before. And also time to order the new mill built. That was imperative. The old Factor's resolve to order new construction was plain in the inherited memories the new Factor had received. He had no worries that the populace would balk at the commands, no doubts that this might not be the best course for them and their world.

Such concerns were simply not an issue that mattered to the Factor or those who directed him, and hence were not included in his complex programming.

The Factor moved off his couch. He was tall and supple-jointed, clad in a slick, almost rubbery, black suit that merged imperceptibly into boots. His features were nondescript almost to the point of invisibility; his head was hairless; his limbs, although not heavily muscled, seemed powerful. His irises were silver.

Beside a metallic cabinet as tall as himself, the Factor stopped. He picked out a sequence on a keypad blazoned with icons. In a slot at waist level materialized a bar of worthless atomically pure gold. The Factor crooked his right arm, picked up the ingot with his other hand, and placed it on his horizontal forearm up near his elbow. Another brick appeared; it went next to the first. This continued until the Factor held, apparently effortlessly, about a score of stacked ingots that must have weighed well over two hundred pounds.

Without haste the Factor exited the main cabin of his ship. Passage through corridors and portals brought him to a huge bay filled with auxiliary craft. There the Factor entered a landing pod. He piled the gold neatly on a floating pallet waiting inside the spherical pod. He sat in the command chair, then activated the pod's screens and drive. Several panels showed various views of the Valley, while one disclosed the big ship itself, as if seen from a small device already on the ground. In this last screen the Factor witnessed his pod's departure. Like a cell budding, the daughter craft separated from the floating sphere and rapidly dropped, down toward its tradition-bound meeting.

Within less than a minute, under swift acceleration and deceleration whose forces the Factor did not appear to feel, the pod came to a rest on the earth. The Factor got to his feet. He caused the outer door to open.

The natives awaited him. They were impressive in a primitive way, as a school of bright fish might be.

The pod had arrived roughly halfway along the length of the Mill, settling in the middle of a vast playing field in a compacted bowl-shaped hollow worn by the accumulated landings of four hundred years. Here it would stay during the seven Days of Festival—a celebration that began soberly but soon escalated to what amounted to a bacchanalia utterly unlike anything indulged in during the rest of the year. A curious custom, thought the Factor, and one he would welcome the chance to observe.

Stepping to the port, the Factor made his ritual initial appearance. The field had been decorated with bright pennons and streamers, all strung from a multitude of wooden poles. Numerous booths had been erected by

outsiders to the Valley, who arrived each year to share in the new prosperity. Here were sold such items as food and drink and clothing, jewelry and geegaws, and other novel diversions distinct from the familiar goods in the Company Store. This was the only time hoarded coins circulated in the Valley, as the elaborate credit and barter system utilized by the Valley dwellers could not extend to outsiders, who demanded payment in solid currency.

Beyond the booths were sixteen billowing tents, striped with the colors of the individual mills, their flaps closed against competitors and the curious. Inside these awaited samples of the year's luxcloth, trucked from the various storerooms, ready for the Factor's inspection.

A ramp extruded itself from the Factor's feet to the ground. At the foot of the ramp waited sixteen men, mostly old, wearing their freshly cleaned and pressed black suits and white shirts and heavy shoes, all so drab compared to the shining stuff they produced. Beyond them clotted a tremendous crowd, all respectfully hushed.

The Factor raised a gloved hand. The hush intensified in an indescribable fashion, as if silence could be doubled and redoubled like noise, until it reached a magnitude almost painful.

"I am here to judge and to winnow," said the Factor, shattering the loud silence with the words instilled in him, "to separate dross and chaff from the pure and valuable. Whatever satisfies me I will buy, and the fame of your work will travel with me among the stars."

"We are ready," the Master Luminaries chorused simply.

A nearly visible wave of relaxation coursed through the crowd of workers, as the greeting was completed according to form. Murmurs of speculation and excitement sounded like a minor duplication of the Mill's normal purring, which was absent during the Festival.

The Factor descended the ramp, the Master Luminaries parting to allow him into their middle. As a group, the men and the Factor moved off.

Now the Factor experienced the familiar yet always disorienting doubling of perceptions and memories that never failed to accompany jacking in. He possessed all the memories of all his brother Factors who had ever visited this world, yet not totally integrated into his private consciousness. Thus all he saw appeared at first mysterious and strange, then a second later, totally explicable and mundane.

Striving to completely internalize his artificially acquired past, the Factor still found time to appreciate the spectacle before him. He had landed during late afternoon. The big white sun was being hauled down by invisible tethers to below the western ridge, like some impossible dirigible. How good its autumnal heat felt, after the time spent within the ship, how clear and penetrating the blue-white light. And the smells of harvest-time, the slight dampness and chill in the moving air. . . . They tingled on his chemoreceptors.

Did these backward, unsophisticated folk realize the wonder of their world, of any world? Did they know how lucky they were just to inhabit such a bountiful globe, out of all the charred and dead and frozen ones the Factor had seen? For a brief moment the Factor almost envied them their uncomplicated primitive existence. They were so unlike the aloofly superior humans who had ventured Inward. The Factor felt a paternal care for these primitives envelop him. He was glad to be able to provide such a focus for their simple lives.

It did not matter to the Factor then that he had been engineered to feel just such an emotion. After all, considered rationally, every creature, whether organic or not, was engineered to feel certain things.

And this charming divertissement, the Days of Festival! What a lot of work and preparation had gone into this Mill Valley Mardi Gras! As a proportion of the Gross Planetary Product, it was quite significant. The Factor directed his gaze all about, careful to record everything, since he knew that when he returned to his human motivators his memories would be minutely and exquisitely probed and analyzed and correlated by those cryptic beings, for whatever they could extract and utilize in their enigmatic schemes.

One of the Master Luminaries, the Factor suddenly realized, was addressing him. The Factor turned to face the man, as the group continued their traditional promenade among the booths, for the purpose of allowing everyone to circumspectly gape at the Factor and ascertain his awesome unchanging immortal reality for themselves.

"Factor," said the man, who had short grizzled hair and a thick jaw, "we realize it is late in the day, but perhaps we can still make a tour of the mill of your choice, so that you can see that we continue to abide by the old ways of production."

The Factor, after a fractional hesitation while he matched facial image to memory, replied, "Indeed, I think we can fit the tour in, Master Otterness. As I recall, I visited the mill of the Red Stalkers last year. This year. . . ."

The Factor considered his choice. It would be well, he thought, to pay an honor to this very man, who had a record of being one of the Factor's staunchest partisans. "This year, let it be your mill, the Blue Devils."

Watching the man swell with pride, the Factor congratulated himself on the political wisdom of his choice. It was good to sow envy and contention, for it raised the levels of creativity.

Hearing the Factor's decree, the Luminaries now directed their course toward the distant Mill. They soon reached the edges of the crowd. Ready to strike off down the path to the Mill, they were halted by Otterness's sudden darting escape back into the crowd, from which he dragged forth a young man to join them.

"Factor," said Otterness, "you remember my assistant, I hope."

"Certainly. Charley, how are you?"

The young man tugged at a short-billed cap he wore and inclined his head respectfully. "Very well, Factor. Very well. I—we're all glad of your return."

Nodding beneficently, with an air of much wisdom, the Factor said, "We are all part of a master plan, Apprentice Cairncross, and I merely fulfill my part."

The Luminaries expressed their appreciation of this sentiment with various wordless sounds.

After their mutual cooing was over, Otterness spoke the next words of the ritual. Chosen as host by the Factor, he could request the presence of one other member of his mill on the tour of inspection.

"Factor, I wish to nominate as the extra member of our party my protégé, Charley Cairncross. After all, someday he will stand in my place, and might as well become accustomed to his future duties."

The other Luminaries harrumphed and coughed, jealous of the extra attention focused on the Blue Devil mill. The Factor approved. Such unexpected shifts and seeming favoritism were necessary to keep this little hive of humanity humming.

"Of course, Master Otterness. I fully approve your choice."

And so the group, enlarged by one, left behind the noisy, exuberant crowd and entered the shadow of the Mill.

The tour of the strangely silent mill took several hours. In the elfinlit twilight the little party moved from section to section, among the resting hulking machines: carding, gilling, doubling, twisting, roving, spinning. . . . They ended up in the weaveroom, inspecting the unfinished lengths of lambent cloth. The Luminaries were all eyes, eager to see any secret blends Otterness might have carelessly left in the open. But the resident Luminary wore such a look of self-satisfaction that they knew any such things would have been hidden well in advance, in anticipation of just such a visit. After all, had they not taken just such precautions themselves?

At last the tour of inspection was over. The Factor signified his approval of all he had seen, and the group rejoined the crowd outside. Now it was early evening. Odors of cooking drifted among the huge bonfires that had been lit. The material for these pyres, the Factor knew, was partially composed of discarded household items contributed by each family, in a ceremony of renewal that intrigued him. How easy if burning the old were all that was required to create the new. . . .

The Factor was now brought to a long table draped with a piece of luxcloth that added its glow to the light from lamps and fires. He was seated at its middle, with eight Luminaries on either side. They all fell to eating. The Factor pretended to enjoy his food. Meanwhile he watched the crowd. There were no tables for the common workers, only scattered benches, and the workers took advantage of the constant movement of the crowd to circulate past the Factor's table, watching him eat as if it were the most marvelous thing in the world.

A familiar figure caught the Factor's eye some distance away, and he magnified his vision. It was Charley Cairncross, and he was with a group of people that the Factor surmised must be his relatives: a young wife with a toddler, an elderly couple that had to be his parents, a thin graceful youth and another young woman, whose resemblance to Charley made them his two siblings. Everyone in the little cluster seemed tense, the focus being the father. Charley, standing, bent over the seated patriarch in a cajoling fashion. The older man wore a sour face and stubbornly stared into the middle distance, apparently refusing to listen to his son. The Factor's boosted his hearing and ran through several filter sequences, finally managing to extract a bit of their conversation from the general hubbub.

"Da, try to be more cheerful. Alan, Floy, tell him he's acting like a senseless old bull. There's nothing to account for such an attitude. It's Festival, after all, and we're here to celebrate."

"What have we got to celebrate?" the father demanded. "What but another year of servitude?"

"Da, don't . . ." said the brother, Alan.

"Don't talk to me, you little catamite. You're as bad as your sister."

The Factor's attention was distracted from this interesting display by the rising of the Master Luminary at his right, a skinny middle-aged man he identified as the overseer of the Landfish. The Master Luminary coughed several times until he had the attention of those closest to him. They fell quiet, and from them the silence spread among the workers, who began to draw in closely to the table. Soon the entire gathered populace, save for those at the very furthest extremes, was hushed and expectant beneath the watching stars.

The Master Luminary spoke loudly. "The Factor will now address us."

Then he sat down. On cue, the Factor arose. He made the requisite internal adjustments, and when he began to speak his voice boomed out without distortion, carrying almost over the entire crowd. Of duty and reward and the happy unchanging durable nature of their lives the Factor spoke at length, varying his speech only slightly from previous years. The crowd seemed to appreciate it, in a sleepy fashion. But the Factor's closing words caused them to grow alert. "And now I call upon you—you lucky ones, who labor for worthy ends in the Mill, and share in the bounty of the system—to extend your generosity. I call upon you to arrange construction of a new addition to the glory of the Mill, so that more outsiders may share your humble, shining way of life, and cause the wonder of the luxcloth to spread even further throughout the stars."

The Factor ceased speaking. There was silence for a strained moment from the assembled listeners. Then someone vented a loud if dutiful huzzah, and soon the night air was split with calls and cries and whistles and yells. The bonfires blazed higher, and the crowd began to move again.

Sitting, the Factor received the congratulations of the Master Luminaries, all of whom pledged their best to hasten the construction of the new mill.

Curiosity subroutines moved the Factor to look for the Cairncross family once more, when the hullabaloo had died down a bit. But the affecting tableau they had formed was nowhere to be seen, broken up and dispersed like flotsam in a stream.

The night wore on. The Factor catalogued many more experiences in his unwearying way. Everything and anything might be of interest to his masters.

The first man to spot the fire break through the roof of the Mill ended the celebration. His sickened, curdled

shouts of "Fire! Fire in the Mill!" brought the Master Luminaries and the Factor to their feet.

All eyes now turned to the Mill, there to confirm the alarm.

From the roof of the immense structure licked as yet tiny tongues of flame, evilly alive against the dead hide of the stolid creature that was the nonsentient but ensouled Mill. Even as the dumbstruck people watched, the flames seemed to grow in strength and power.

Otterness broke the trance. "Get men down into the cellars!" he shouted, referring, the Factor knew, to where the hidden river could be reached. "We must form the bucket brigades!"

Otterness moved then as if to lead the rush to his threatened beloved mill, but the Factor restrained him. "There is no need to endanger your people. My ship is quite capable of ending this blaze. I will issue the commands from my pod."

Shouts of "Praise the Factor!" quickly mounted. Otterness looked uneasy, however, but restrained himself. The Factor traversed the short distance to his pod and gave orders for the mother ship to drop and begin spraying.

He returned to the table of Luminaries. All the Masters looked nervous. The Factor noticed Otterness was missing. He asked where the man had gone.

"To the Mill," replied the Landfish Master. "He and his apprentice insisted on going in. We tried to stop them, Factor, but they would not listen. Honestly, they wouldn't."

The Factor considered. The substance his craft would soon begin spraying was a chemical flame retardant that might asphyxiate the men. Yet without it, the whole structure would swiftly go up in an inferno. He could not be responsible for their deaths. That was an integral part of his programming. His policy of benign neglect of their whole society was not consistent with this individual and particular loss of life.

"I will rescue them. Please insure that no one else tries such an irrational thing."

Then the Factor was off.

Moving faster than any human could have, he covered the distance to the Mill in a blur.

At the entrance doors he looked up. Like a falling moon his ship had descended. Even now it was beginning to discharge the retardant. Without choice now the Factor went in.

Here on the first floor the only signs of the fire were smoke and hot dead air. With crystal-clear memory the Factor summoned up the location of the stairs. In seconds he had gained the second floor; seconds later, the third.

A smoky crackling inferno greeted him at the head of the stairs. The incredible popping noise of destructing bricks resounded sharply at intervals. Heat assaulted his senses, and he could barely see. He activated routines to filter the visual noise. The loci of flames leapt out of the confusion. Stepping out onto the floor, the Factor set out to find the men, who he was fairly certain would have rushed uselessly here, to the center of the disaster.

All the ceiling timbers above the Factor were ablaze. He heard the rain of chemicals descending, but knew that this third floor at least would definitely be lost, no matter what.

"Otterness!" bellowed the Factor. "Cairncross! Where are you? There is no need!"

The Factor's supersensitive hearing seemed to distinguish faint calls from deep within the Mill. He pushed on, ignoring the flames that frequently lapped at him. Twice he had to lift a fallen flaming timber from his path.

Emerging from one such barrier into a relatively clear eddy, the Factor realized he had come upon the men.

Oddly, there seemed to be three.

Yes, three men struggled in a mass. One was the elder Cairncross. He held a can of oil in his hands, with which he fed the flames. Trying to restrain him were Charley and Otterness. But the wild man's strength seemed indomitable, and he continued to sprinkle his oil like a satanic priest asperging his congregation of devils.

The Factor rushed forward and effortlessly scooped up Charley and Otterness like two weightless sacks, tossing them over his shoulders.

Charley's father, released, raked them all with a final frantic glare and, letting forth a tremulous soul-bursting scream composed of years of pent-up inexpungable frustration and bitterness, hurled himself headlong into the nearest flames.

"Da!" screamed Charley, and tried to break free. But the Factor held him tight. Gripping the men with steely strength, the Factor turned and made for the stairs. He moved so fast and unerringly through the least damaging flames that by the time he emerged out into the open air Charley and Otterness had suffered only minor smoke inhalation and burns.

Depositing his burdens upon their own shaky feet, the Factor turned toward the Mill. His ship was dropping mechanical remote-units into the building through the gaps in the roof to battle the remaining spot fires. Everything seemed under control.

Sensing a vast crowd behind him, the Factor turned to confront it. Surprisingly he saw that their shocked attention was concentrated on him rather than the subsiding conflagration. Raising a hand to command them, he realized why.

The Factor's suit had burned away in many spots. So had much of his artificial flesh. The hidden titanium armatures that articulated him shone through. Touching his face, he found it gone.

"It is all right," the Factor said. The people backed away unconsciously when he spoke out of his charred, indestructible self. "It is all right," the Factor uselessly repeated. "The fire is under control. Everything will be as it was."

But even as he said it, he knew it wasn't true.

5

At the mouth of the Valley, the caravan came to a halt. The lead steam-carriage, an elegant Whaleford six-passenger landau, shuddered to a stop, bringing the ones

behind it—a mixed lot of cargo carriers, with tents lashed to their roofs—to an obedient standstill. Gear-trains disengaged, the cars thrummed with the silent power of their coal-fired Tarcat boilers.

The lead vehicle, as were all the others, was emblazoned with the gilt crest of Factor's Head University: a blank-eyed mechanical face replete with fanciful rivets, surmounted by a depiction of the constellation known as Factor's Ship. Completing the heraldry was a banner bearing the motto: "Growth From Ashes." The hood of the landau bore a silver ornament in the shape of a wainwalker, those stolid beasts gone these many years from the streets of Tarrytown City where the University was located.

The doors of the landau swung open now, revealing plush-padded inner panels, and its passengers emerged into the bright summer sunlight. Overhead, a soaring cliff-kestrel banked and let out a scream.

The driver of the Whaleford was a middle-aged man dressed still in the professorial garb he affected when in the classroom: a lightweight vested suit of flaxen dreamworm cloth, imported from the tropics, and a pair of ankle-high leather boots. In this conservative outfit he resembled any of his fellow pedants. Only in his choice of neckwear did he exhibit any oddity or individuality of taste, for the man wore an antique tie made of the old-fashioned stuff known as lux. In the light of the sun it cast its own radiance. An expert in antiquities had confirmed family legends regarding the tie: it was a blend of Palefire and Idlenorth fibers, one of the last fabrics created by the defunct Mill.

Now the passengers of the lead car—four men and two women—were joined by others from the cargo vehicles. These latter folk were plainly laborers. Together, the crowd faced north. Shading their eyes, they raised their faces to the sky.

Someone whistled; a woman gasped; one of the laborers said, "I'll be a furfaced abo—"

The driver of the landau spoke. "It's impressive, all right. Especially up this close. I've had the Factor's Head explain it to me a dozen times now, and I still don't understand the exact nature of what keeps it up there. I don't think we'll be ready to grasp it for another generation or two. But remember—strange as it seems to us, it's only science."

What captivated the visitors to the Valley was the sight of the Factor's mother ship. Suspended like a lost silver moon above the ruins of the Mill halfway up the Valley, it hung as motionless as a mountain. The only evidence of any sort of imperfection was several open hatches. Thus it had remained for decades, tenantless and unvisited, by either planet-dweller or one of its mates from the stars.

The leader of the expedition spoke again. "Well, we'd best continue. We need to set up camp before nightfall, and we've still got a few miles to go to reach the site. And if the old road ahead is anything like what we've traversed so far, it'll be slow going. This is hardly the Grand Concourse. No pavement here."

"Nor no ladies of low virtue either," added one of the laborers, provoking much laughter which served to relieve the slight tension they had all been feeling.

The crowd broke up. One of the other drivers opened wide the door of his vehicle's boiler, exposing the open flame to add more fuel. At that moment, someone shouted.

"Professor Cairncross! Look!"

From out of the undergrowth paralleling the track emerged a squat mechanism. Big as a footstool, it moved stiffly on three spidery legs, advancing on the carrier with the open firebox.

The intruder was suddenly the focus of a dozen rifles and pistols carried as protection against dire wolves and other wildlife. Professor Cairncross stopped the men before they could fire.

"No, don't—I think I know what it is. . . ."

The automaton homed in unerringly on the open flames. Once upon them, it swiveled a nozzle at the heat source. A sound of dry pumping ensued. After a few moments of this fruitless activity, the little mechanism lowered its nozzle in defeat, collapsed its legs underneath itself, and sank to the ground.

"Let's go," said Professor Cairncross. "And remember, whatever curious things we may see, they'll all be as harmless as what you've just witnessed."

In the car and once more in motion, the passengers of the landau were silent for a time. Then one of the women spoke.

"Are you really so certain, Charles, that we won't encounter any dangers?"

"Basically, Jennifer, I am. The oral history and the written accounts all tally. The Factor's Ship never disgorged anything except him, his lighter and the clockwork firefighters. It's true that after the Valley emptied other constructs may have landed, but it seems highly unlikely. It was all under the Factor's control, and once he suffered his fate, he was unable to contact his ship via the lighter. He's told me so often enough. And though one must always take the Head's talk with a grain of salt—the damage it suffered manifests itself in strange ways—I'm inclined to believe him in this case."

"Well, you certainly sounded confident enough. I'm sure the workers were heartened."

Professor Cairncross appeared embarrassed. "Just part of my job, after all. We wouldn't have much success in our dig if we were always looking over our shoulders for some alien menace. No, I expect that the most we'll meet will be a few friendly ghosts."

The road was indeed nearly impassable in spots. The expedition had to stop often to fell with axes the larger trees that had grown on the median strip; the centuries-compacted dirt ruts had proved more impenetrable to seedlings. Through the dense foliage running alongside the old track, they could catch occasional glimpses of the Mill and its many associated dwellings, the residences all broken-roofed and shatter-windowed. They encountered no more ancient firefighters, but the going was still slow. It took till dusk to reach the site selected by Professor Cairncross and his fellow archaeologists.

The Field of the Festival was nearly all overgrown

with copses of sapodilla and jacaranda. However, a grassy clearing about the size of a ballfield remained, not far from the road. Here they chose to pitch their tents, leaving the vehicles lined up in the track.

While the tents were being raised, Professor Cairncross took Jennifer and the rest of his University colleagues on a beeline across the tree-dotted field. What directed him, he found hard to say. Surely hours of studying old maps had a lot to do with his certainty, as did hours of listening to his grandfather and namesake ramble on in his half-cogent, half-dotty way about life in the Mill Valley. But there was more guiding him than these things; it was an instinct almost genetic, a rising of ancestral feelings and memories.

Within minutes they had come upon the Factor's little ship, trees growing right up to its walls. Grass—having sprouted in wind-deposited soil on the very ramp—licked at the door, into which leaves had blown. The scat of some animal wafted pungently from inside the vessel.

Professor Cairncross's excitement was nearly palpable, and transmitted itself to the others. Sweaty, dressed for city streets rather than cross-country trekking, their faces showing the rising welts from branches, his comrades did not protest when he said, "Let's press on, toward the Mill. I want to find the Factor's skeleton."

They burst from the marge of the woods, and stopped. The oily waste strip had resisted organic encroachments much more easily, and only the toughest weeds grew there. They had an unobstructed view in the gold and purple twilight of the sad, silent, sag-roofed Mill, parts of it crumbled by flooding of the Swolebourne, its central portion still exhibiting the effects of the fire that had unmasked the Factor and precipitated his demise and the abandonment of the Mill.

Professor Cairncross scanned the waste fruitlessly. Then Jennifer said, "There, that glint—"

The metal armature of the Factor was wreathed in maidenshair, as if the earth strove to clothe it.

Professor Cairncross shivered. "I can feel it as if it were yesterday. I'd sit on my gran'da's knee, and he'd tell me how the Factor was decapitated with a dozen blows from a huge wrench, wielded by his old boss, Otterness. Once I thought I'd found the very wrench, an old rusty thing in my father's shop. But it turned out to be much too new. I think I'd date my desire to do archaeology to that moment."

Jennifer said, "And look where it's led you. To something much more exciting than an old wrench!"

Back at the camp, a fire was already going. All throughout supper, they half expected more clockwork visitors, starting at every sound from the surrounding woods. But in this they were disappointed.

As he fell asleep in Jennifer's arms that night—their betrothal had been announced last month, and it had not taken them long to get a jump on the actual marriage—Professor Cairncross thought wistfully how wonderful it was that this expedition, the first such, could include women. The Head's revelation a generation ago of the dietary deficiency that had limited female births for so long, and how to correct it, was having far-reaching changes already. . . .

In the morning, Professor Cairncross arose before the others, with first light. He felt the need to be alone with his thoughts and emotions.

Wandering away from the camp without any intentions, he soon found himself among the brick houses of a Village. In one such, his ancestors had passed their whole lives. It was nearly inconceivable. . . .

Outside the Village, he came upon an old midden of waste bricks, nearly concealed by vegetation. Time and the elements had softened what must have once been a formidable pile. Moved by some urge he could not explain, excitement mounting in his breast, Professor Cairncross climbed awkwardly to the top. It took only a few adult steps.

Yet when he stood atop the brickpile, sourceless tears tickling his cheeks, he felt master of all he surveyed, and king of the world. ✦

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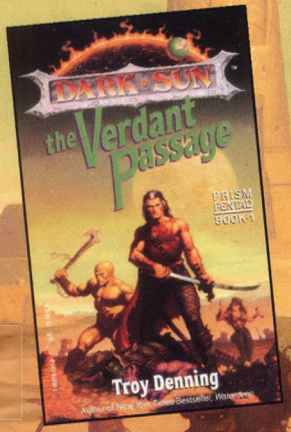

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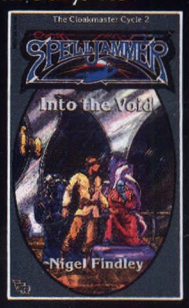

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