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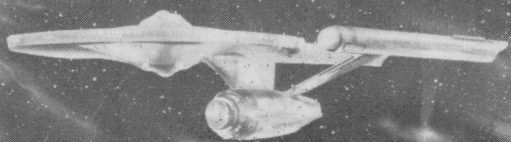
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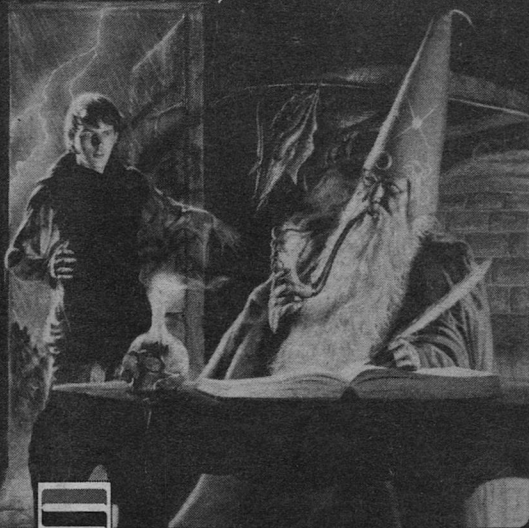
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## Editorial

# THE OTHER KIND OF TYRANNY

Stanley Schmidt

**T**he people who use them seldom think of them as such, but social institutions are tools.

Unlike many of the tools with which we are now familiar, they are more evolved than designed, but that doesn't necessarily have to be so. Many traditional tools have also been that way. Most cultures have tended to farm in particular ways not because its members thought about what they wanted to achieve and figured out how to make plows and other implements which would best serve their needs, but because their ancestors had "always" used those ways. Once in a while somebody comes along with a new gadget that demonstrably does something better, and it

catches on and becomes a new tradition. One of the distinguishing characteristics of recent history is a widespread recognition that consciously trying to design tools that do their jobs as well as possible can lead relatively quickly to *much* better performance. Thus it is that modern agriculture, using implements and methods produced by deliberate invention, achieves results which were totally out of reach even a short time ago. Is it not possible that applying a similar level of directed effort to the design of social institutions might allow similarly large strides toward making them do better what they are supposed to do?

At least one mechanism for conscious

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social design already exists, of course: legislation. At least one other has been receiving a good deal of overt recognition and enthusiasm lately, and that is what I want to talk about shortly. First, though, I would point out that before sitting down to design *any* tool, it's a good idea to have clearly in mind what its purpose is. With social institutions, that's not easy. In a general sort of way, most of us could probably agree that such things as governmental and economic systems, marriage customs, food and dress taboos, and rules of etiquette exist to regulate the interactions of individuals and the groups to which they belong. But what constitutes "good" interaction? A basic difficulty of "social design" is that each of the many individuals involved is likely to have a different answer, and what's best for the group as a whole may be different from any individual answer—and hard for any individual to see clearly. In the crudest biological terms, the central goal is survival of the species—which, as our species is finally beginning to learn, is not necessarily equivalent to maximizing the number and/or lifespan of individuals. Our species also has a widespread belief—and it might be argued that this is one of the important things that sets our species apart from many others—that *quality* of life is also important. (Though it might also be considered a luxury, in that a society can afford to think about "quality of life" only after the problem of "mere survival" is under control.) Since life is ultimately lived by individuals, many civilizations have made individual hap-

piness one of the goals of optimizing their social institutions.

Which leads us back to the question of how, once people decide that a particular kind of interaction is good for the society as a whole and/or its individual members, the appropriate kind of behavior can be caused to occur. The process *always* involves controlling individual behavior. If murder or robbery is considered undesirable, something must be done to prevent as many people as possible from killing or robbing. Since most cultures consider these particular actions *very* undesirable, at least under certain conditions, the most direct method of control is widely and readily accepted. Armed bodies called "governments" are established and entrusted with the power to expressly forbid and forcefully punish such transgressions.

Thinking people may well have reservations about this. A government is, after all, at least as armed as any common thug, and usually much more so. A citizen may welcome its protection but at the same time worry about what assurance he has that it can be trusted with its power. History is full of governments that used their powers with little judgment, restraint, or concern for real justice. Many have applied punishments out of all proportion to the severity of the offense, and extended their powers to the regulation of trivial or private matters which did not need public regulation at all.

For such reasons, many people regard government control as a last resort—but that does not necessarily mean they can resist the temptation to try to make oth-

ers' behavior conform to their standards and tastes. Sometimes there is a certain amount of justification for this. There is little question that you have a legitimate interest in other people's actions if they directly affect you; and probably few would dispute that everybody benefits if everybody has a genuine respect for the lives and property of others, or that a reasonably clean environment is better to live in than a filthy one. If you believe things like that, and you also believe that government is too dangerous to use for any more social control than necessary, you're likely to look for

subtler methods of influencing other people's behavior.

There is another method which has been around for a long time, and for a while showed some signs of fading. Now it's coming back strong, and lately I've been hearing more and more people openly advocating its unabashed use. It's called social pressure, and it does work—and it's every bit as subject to abuse as governmental regulation.

You don't like loud cars or stereos, but you're reluctant to call the police on your neighbors? Snub them instead. Refuse to associate with them as long

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as the offensive behavior continues, and make sure they know why you're doing it. Bothered by neighbors whose dogs or children roam freely through your flower beds? Same treatment. Don't like people smoking at work? Nag them to stop; eventually they may get so tired of listening to you that they will. Afraid that other people are destroying the moral fabric of society by watching the wrong kind of movies? Picket the theaters and try to humiliate the patrons when they come out. Worried that your friends or relatives are eating unwisely? Tell them about it every chance you get. Lecture them on how they *should* be eating; make them feel as guilty and uncomfortable as you can. Don't like pink ties on men or shorts on chubby women? Make sure they know; ridicule them at every opportunity.

Where do you draw the line? How far can you go and still live with yourself?

The usual answer seems to be that most people can cheerfully go as far as the current social climate will let them—and that's where the danger is. The tactics lately being promoted to make people do things the way somebody thinks they should, while "avoiding the evils of government interference," are exactly the tactics most of us remember being subjected to in grade school and high school. "You *must* go to all the football games. You *must* wear a flattop. How could you even *think* of wearing white socks?" Probably most of us who can remember those pressures can also remember wanting things that differed from the ones we were being pressured to want. Some were lucky enough to find the courage to resist popular pressures, but

many were not. Many in both categories can probably recall relief at outgrowing (and watching their classmates outgrow) the need for group pressure to dictate every little move an individual made.

And now some people want to bring it back—because they remember, at some level or other, that it *works*.

It can, admittedly, even do some good. Neighbors who intrude on your property or privacy *are* a problem and a legitimate cause for complaint, and pressure tactics may be the only practical course for doing anything about them. Social pressures have been effective in combatting other social pressures, as in the civil rights movement of a few years back.

But is it really your business, or mine, if somebody else wants to wear clothes we don't like, or even eat, drink, or smoke things that we don't think are healthy? The answers aren't always simple, but the enthusiast for "constructive" use of social pressure might well bear in mind that if it becomes too popular, he may sometime find himself on the receiving end in a matter he considers no one's business but his own. He might then reflect that the matters in which *he* is so righteously pressuring others may look just the same to them.

It's true that subjecting private matters to government interference is risky and best avoided whenever possible. But the danger lies not in the fact that it is the government doing the interfering, but in the fact that interfering is being done. Government that decides everything is its business becomes tyranny. So does the use of *any* kind of control, including social pressure, by any group of people which decides everything is its business. Either gov-

# THE PRESENT

Harlan Ellison on "Dune"

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ernment or social pressure can do worthwhile things, but either is fraught with danger unless the people using it think carefully *beforehand* about whether their interference is really justified—and proceed only if they can make a very strong case.

Of course, if you can get enough people thinking often enough and well enough to make *that* work, you're well on your way to eliminating a lot of unnecessary problems anyway. One way in which social pressure might actually be well used is in making itself unnecessary and ineffective—not by pressuring people to conform to particular fashions of eating or dress or other such trivia, but by making thought, consideration, and tolerance fashionable. I propose two radical concepts as potential keystones of making a society function well with minimal dependence on *either* governmental or societal pressures of the types described above:

(1) Parental responsibility.

(2) Recognition of adulthood.

Both may seem trivial; neither is. There is one time when, if a society is to function with any sort of continuity at all, a certain amount of control by others is necessary. That time is childhood—a period of variable length when an individual is neither capable of living on his own nor equipped with the skills and attitudes needed to coexist with his fellow creatures. The fundamental responsibility of parents is to guide and assist in developing those skills and attitudes, not for the purpose of controlling their offspring's entire lives, but for the purpose of making them able to function successfully and responsibly *on their own* when they reach an age

called adulthood. A healthy society would seem to require a heavy concentration of parents who take that responsibility very seriously—and a general population that recognizes that once people *reach* adulthood, they can and must bear responsibility for their own decisions, *without* their peers trying to live their lives for them.

Of course, it's not easy. The parents responsible for the Stage 1 education that makes Stage 2 viable cannot rely on mere traditions shoved unthinkingly down a new generation's throat. Conditions change; responses must change along with them, and one of the things parents need to instill—but too seldom do—is a deep-seated recognition that change is normal and adaptability the key to survival. Another is the ability to resist social pressure and refuse to consider it, in and of itself, an adequate reason for action.

And, both as parents and as citizens, they must expect to do a continual re-tuning of their ways to keep the system functioning regardless of changes. Teaching children that "the key to a good life is such-and-such" will be successful, in the long run, only if they can plainly see that such-and-such *works*. If it does, they will not murder or rob because they will feel no *need* to murder or rob; otherwise they can only be deterred, however imperfectly, by the threat of force. So what they are taught must be not only well meant, but *right*—and it must have a built-in provision for readjusting itself to *stay* right.

It's a tall order. But any society which can manage it will have something far preferable to *either* kind of tyranny.



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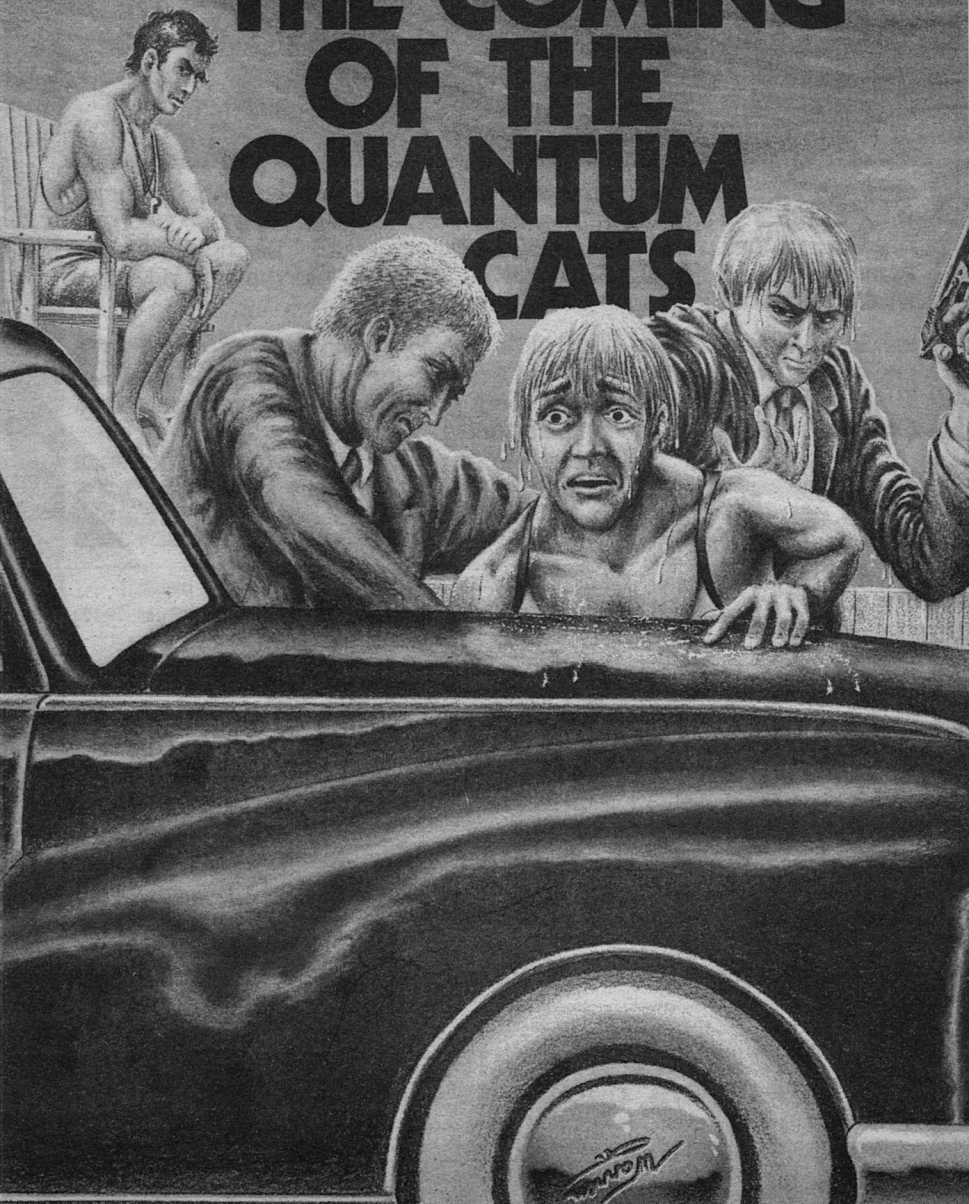
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Frederik Pohl

# THE COMING OF THE QUANTUM CATS



Part One of Four

When incontrovertible evidence leads to two conflicting conclusions, maybe some of it isn't as incontrovertible as you thought. Or maybe the rules of the game aren't what you thought.

William R. Warren, Jr.



**It is customary to print a disclaimer in novels, saying that the characters are fictitious and no resemblance to any real person, living or dead, is intended. This is, in the case of this story, wholly true, in spite of the fact that some of the characters have names made famous by position and deeds. The reason is that, in each case, the characters portrayed are what the real-life characters might have been . . . if they had been someone other than the persons they were.**

August 16 1983

8:20 P.M., Nicky DeSota

When my beeper sounded I had one hand on the gearshift, ready to jump into second, and the other sticking out the window to signal a left turn. My attention was on the traffic cop, who was taking an annoyingly long time to let the Meacham Road traffic through. My head was full of Adjustable Rate Mortgages, points, GI loan eligibilities, and whether or not I could still get in a swim with my girlfriend after dinner. It was a Tuesday and therefore a good time to swim because, sometimes on a weekday night, after it gets dark, the lifeguard looks the other way if somebody goes topless.

The beeper shattered all of that.

I hate to let a phone go on ringing. I took a chance. I took my hand off the gearshift to pick up the phone. "Dominic DeSota speaking, yes?" I said, just as the cop remembered that there was traffic waiting on Meacham, and waved peremptorily to me to make the turn.

So then everything happened at once.

The motorman on the interurban trolley saw that I was hesitating, so he

started across the intersection at the same moment I stepped on the gas. The operator on the other end of the phone said something that sounded like Chinese, or maybe Choctaw. It wasn't either of those, it was just that she wasn't tuned in right. You know how they get when it's near the end of a shift and they're getting tired and a little sloppy and they just make a stab at your frequency without worrying about getting it exact? I didn't understand a word of what she said. I didn't care just then, either, because all of a sudden there was a twenty-ton lump of tandem trolley right in front of me, a lot too close for me to stop. The trolley couldn't turn away. I had to. And there was only one way I could go to miss the collision, and unfortunately the traffic cop was standing right in the middle of that way.

I didn't hit him.

That was more to his credit than to mine, though. He jumped out of the way. *Barely* out of the way. Enough so that I took the polish off his boots but didn't mangle his toes.

I don't blame him for giving me a ticket. I would have done the same thing. I would have done a lot worse; I wouldn't have blamed him if he'd run me in then and there, but he didn't. He just kept me hanging for three-quarters of an hour, parked on the shoulder of the road in front of the Forest Preserve, with all the other motorists rubbernecking at the poor simp who was getting a ticket as they went by. He spaced it out. He'd come over and ask for my license and study it for a while. Then he'd go back to untangle the traffic snarls while he thought it over. Then he'd come back and ask for some other



I.D., or for my employment history, or about how long I'd lived around Chicago or how come I didn't know a car was supposed to yield the right-of-way to a trolley.

In between times I kept trying to raise my beeper call. In my business you live by the telephone; somebody calls up and needs a mortgage, and if you don't service them right away they'll just call somebody else. Besides, this particular call had sounded a little worrying. It was hopeless. You never get the same car-phone operator twice, of course. The ones I did get were highly amused at my quaint notion that they had nothing better to do than check out calls that had already been passed along to the subscribers. Then, when I insisted, they were scandalized. "Do you have any *idea*, Mr. Dominic," demanded one, "how many call slips I'd have to *look* through to find yours?"

I said, "I guess about a million, as long as you're looking under the wrong name. It's not Mr. Dominic. It's Mr. DeSota. Dominic DeSota."

To that thrust, no counter. Instead, "You're not even sure she had the right frequency," she said, as indignantly as though I'd betrayed her trust by switching the frequencies on her myself. "The call could have been for somebody else's number completely."

"Not, I think, with my name," I offered, but by then the traffic cop was on his way back, to ask me if my parents had been citizens of a foreign power or whether I had any communicable diseases. He looked quite annoyed to see that I was talking on the phone instead of devoting my complete attention to the repenting of my sins. "Forget it," I told

the operator. Took my ticket. Licked the officer's boots (metaphorically). Swore I'd never do it again (fervently). Drove at a prim thirty-two miles an hour to my bachelor home, and wished that the day had gone better. It hadn't. It didn't show any signs of getting that way. Greta didn't answer her phone. That meant she'd gone out shopping or something. By the time she got back the pool in the Mekhtab ibn Bawzi Forest Preserve would be closed for the night. And I hadn't clinched the mortgage deal. And I hadn't even called the prospects back to keep them on the stick.

And I wondered, I truly wondered, if through the squeaky, squawky static on that abortive beeper call I had really heard, as I almost thought I had heard, the words, "—to the F.B.I."

What I started out to be was a real-estate dealer . . . well, no, tell the truth and shame the Devil, what I *really* started out to be was a scientist of some kind. But there's no living in that, so by the time I got to college I was studying real estate.

Then I got sidetracked into mortgages.

If I tell somebody that the reason for the switch was that mortgage brokers have a more interesting life than realtors, they just stare at me. It's true, though. There's a lot of excitement to mortgages. You're making people's dreams come true, you see, and there are no more interesting people to be around than dreamers. Sometimes the dreams worry me a little, because some of the dreamers are pathetically young couples, just married; I don't know if they know what they're getting into, with interest rates all the way up to five

and a half, sometimes five and five-eighths per cent. But they pay the rates. They borrow thousands of dollars, sometimes two or three years' pay, to get the vine-covered cottage of their dreams. And I was the one who helped them make those dreams come true.

It would have been even more satisfying, I guess, to be a loan officer at a big bank somewhere. Around Chicago that doesn't happen unless you're a relative of somebody powerful, and somebody powerful isn't Italian, of course. In banking, it's Arab. Not that that's so unusual—how many banks are there in America that aren't Arab-backed? Certainly not very many of the big and prosperous ones. So there wasn't much future for me in a bank job, but the Arabs didn't bother me about some of the service jobs, like being a mortgage broker.

Maybe the reason for that was that they didn't know what a mortgage broker was. Most people don't. I was the one who interviewed the clients, helped them choose the product they could afford—or almost afford, checked out their credit ratings, guided them through the preparation of the application forms and the securing of the waivers and variances and permits everyone needs if he wants to own a house.

It's a living. It's also interesting—I know I keep on saying that, perhaps to convince myself. My girl Greta says it to me when I don't say it to myself; she is a big believer in a solid job and savings in the bank before you get married, and we're going to get married one of these days. The job will make that possible.

One of these days.

Meanwhile, it's still interesting, I say for at least the third time, and it also gives me time to myself when I want it. The time when I want time to myself is usually when I can spend it with Greta. The company has a rule that every one of us salesmen must put in five hours a week "floor time"—that's being there, on the floor of the agency, for drop-in or phone-in customers. Outside of that I make my own hours. So when Greta is on a run—she's a stewardess—I put in long days. When she's between assignments I try to make time to be with her. I'm really pleased she has the job she has. . . . No, that's a lie. I'm not. I worry about all the guys she meets, back and forth between Chicago and New York, and where she stays when she overnights in New York. Of course all the stews are chaperoned by the Little Fatimas, but chaperones can be evaded. We know all about that, Greta and I. I really hate the idea that I'm teaching her how to do that in Chicago, and she's using those skills with somebody else in New York. I hate to think that.

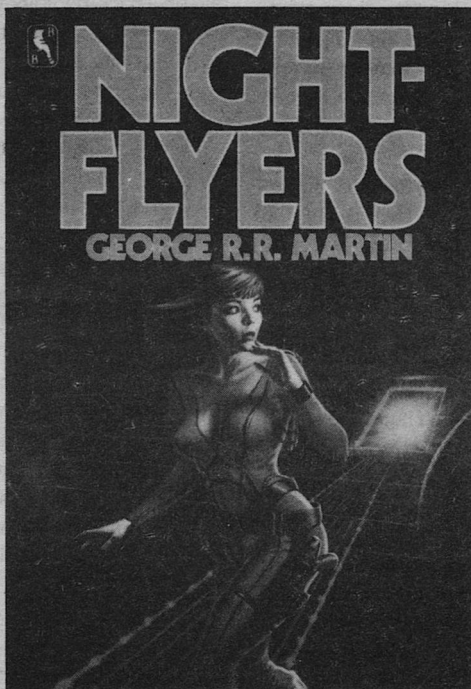
So I try not to think it.

And I did get to go swimming with her that night, after all. As soon as I got home I skinned down to my underwear, pulled down the shades, locked the doors and took a bottle of beer out of the secret under-the-stairs cupboard. While it was chilling in the freezer compartment I tried again to check out my mysterious phone call. By then it was hopeless, of course. My call slip was well buried under hours of accumulation of others. But then I sat down with that luscious cold bottle, sweat glistening along its sides. The phone rang. Greta.

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"Nicky, honey? You in the mood for a late swim?"

I was, of course. I swallowed the beer so fast it made my teeth crackle as it went past, put on my suit, was already in the water by the time she got there and dove in beside me.

There weren't many people in the pool at that hour, but all the male eyes were aimed at her as she came off the diving board. Greta is a pretty sight. She is five feet eight, blonde, green-eyed, very slim waisted. Men look at her a lot. In a bathing suit, even in the skirted, thigh-length kind of suit our pool guards made mandatory, men sometimes drooled. I know. I did it myself.

I swam her down to the dark end of the pool to kiss her. They'd put the lights out to save electricity, and only the bathing pavilion was still bright. We stood in water about shoulder high on me, chin high on Greta, sort of bouncing on the tips of our toes the way you do in the water, and I kissed her thoroughly, and then pulled her close to kiss her again.

She kissed me back. For quite a long time. Then she pulled away and let some of the cold water get between us, sort of giggling. When I reached out again she said, "Huh-uh, honey. You're getting me real steamed up."

I said, "I wish—" and she stopped me.

"I know what you wish. Maybe I do, too, but we can't."

"There's nobody around this part of the pool. . . ."

"Oh, Nicky, you know that's not it. What if I, you know, got, well, *caught*?"

"That's not very likely." No re-

sponse to that. "Anyway, there are things that can be done."

"No, they can't, Nicky dear. Not if you mean the A-word. I could never destroy my child's life—anyway, those places aren't easy to find, and then who knows if they'll kill you or spoil you for life?"

The trouble was that she was right and we both knew it. There wasn't a day that went by without some police raid on a back-door abortionist, with the criminal dragged away by the police and all the patients trying to hide their faces from the news cameras. We certainly didn't want *that*.

There was hardly anyone left in the pool now. No one seemed to notice that we weren't swimming. Greta eased back closer to me, did not resist when I kissed her again.

"Nicky?" she whispered in my ear.

"What, honey?"

Faint giggle, then a whisper so low I could hardly hear the words: "What about going topless now?"

I looked around. Apart from a couple of elderly men in bathing suits and robes, finishing out a checker game, the only person left in the pool area was the lifeguard. He was reading a newspaper under the exit light.

"Why not?" I said.

And I reached down between us and slowly, slowly unzipped the top part of my bathing suit.

Now, you have to remember that going topless is not really some big crime. In the city code it's called a Class 3 Misdemeanor—that means they never arrest you for it, just give you a ticket, as for parking in the wrong place; the

fine is never more than five or ten dollars and the judges hardly ever give a jail sentence. Often when a man goes topless they'll let him off with just a warning, if it's a first offense.

So I did not expect what happened.

I did not expect that all the pool lights would come on at once. The checker players yawped in surprise as someone came running right through them, sending the board flying; that was only one someone, and there were others coming from all directions—through the men's dressing room, through the ladies', even over the fence; and they all converged on me. Two large men jumped right in the pool, clothes and all, to grab me and drag me out.

Greta stood staring, chin deep in the water—terrified and bewildered, and no more so than I.

The world whirled, and didn't stop whirling until they had me bent over the hood of a car, just outside the pool fence. The metal was hot; the car had just got here, and it felt as though it had been driven hard. They made me spread my feet wide apart, while a nastily unfriendly cop's hand ran over the wet seat of my bathing suit—searching for weapons, for God's sake? There were two other cars, headlights on and pointed straight at me, at least half a dozen men—and they were pointed straight at me, too; I was the center of it all.

And the only thing I could think of to say was, "Listen! All I did was take my damn top off!"

*And elsewhere in the news—*

The queerness that developed—the questions that were unanswered!

Why should the residents of Los An-

geles suddenly complain that their sweet, orange-scented air was being invaded by gusts of poison gas?

What made twenty thousand peaceable subjects of the Czar suddenly march through downtown Kiev chanting revolutionary slogans?

Why were so many persons being admitted to mental institutions with a diagnosis of paranoid schizophrenia, characterized by a terrified conviction that they were being watched by unseen eyes?

Why were things suddenly so *strange*?

August 17, 1983

1:18 A.M., Nicky DeSota

I've taken the Daley Expressway down into the city a thousand times. Never like this before. Never with sirens going and overhead lights flashing off the hood ornament of the big Cadillac. At that hour of the morning there were not that many other cars on the road, but the ones that were scooted out of our way as soon as they saw the flashers of the Chicago Police Department cruiser that ran interference for us. We made it in twenty-one minutes. Faster than the train; but it was the longest twenty-one minutes of my life.

No one would tell me a thing. "What are you pulling me in for?" "Shut up, Dominic." "What did I do?" "You'll find out." "Can't you tell me anything?" "Listen, son, for the last time, shut up. Chief Agent Christophe will tell you all you want to know—a lot more, even!"

"Son" he called me. That was the gorilla on my right—dripping wet from coming into the pool after me, at least two years younger than I. But there was

a big difference between us. I was the prisoner, and he was the one who knew the answers he wouldn't tell.

There wasn't any sign on the office building on Wabash, but the night watchman let us in at once. There was no name on the door of the suite on the twentieth floor. There was no one in the anteroom of the suite. No one would tell me anything still; but at least one question got answered. I saw the portrait on the wall over the receptionist's desk. I recognized that hallowed old face at once—anybody would—stern as a snapping turtle, determined as an avalanche.

J. Edgar Hoover.

The phone message hadn't been that garbled after all. I was in the hands of the F.B.I.

I don't know if you truly see all your life flashing before you when you're drowning. I do know that over the next few minutes I reviewed every punishable thing I'd ever done. Not just going topless or nearly demolishing a Chicago traffic cop. I went way back. I started with the time I peed against the back wall of Olivet Presbyterian Church in Arlington Heights, when I was nine years old and caught short on my way to Sunday school. I covered cheating on my college entrance examination, and the false claim I'd filed for fire losses when my dormitory burned—the bed and innerspring mattresses I'd claimed hadn't really belonged to me at all, but to my buddy in Alpha Kappa Nu. I even remembered what I had censored clear out of my waking consciousness, the one time I'd really got close to serious trouble with the Arabs. It wasn't a prideful memory. My high-school buddy, Tim Karasueritis, and I had put away

three bottles of illegal beer, practicing to be macho. It wasn't bad enough that I threw up. What made it really bad was that I did it right on the corner of Randolph and Wacker, in front of the biggest, richest mosque in all Chicagoland. And when I had poured it all out on the sidewalk Tim took his turn. While I was holding his head over the curb, I looked up. There was a *hajj*, white beard and green turban, looking at us with furious and accusing eyes. Bad scene! I thought we'd had it for sure, but I guess even Arab *hajjis* have teen-aged kids. He didn't say a word. He just stared at us for a long, long moment, then turned and went into the mosque. Maybe he came out again with the Arab equivalent of the cops, but before then we were long gone, running when we could manage it and somehow staggering away anyway when we couldn't.

Oh, I plumbed my depths. I searched every indictable or reprehensible or merely obnoxious memory I had, without finding one that would justify the F.B.I. coming after me in the middle of the night.

After ten minutes, I got brave enough to decide to tell somebody this fact. There wasn't anybody to tell. They had sat me down in a small room with little furniture. Bear in mind that all I was wearing was a bathing suit. It had long since dried out, sure, but they had the windows open somewhere in the offices, and cold Lake Michigan breezes were coming in under the door—the, as I discovered when my courage reached the point of trying it, *locked* door.

Funnily, even though I wore so little, they had insisted on searching me. They were taking no chance that I might be

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carrying a weapon, I supposed—either to attack one of them, or (maybe in a fit of contrition at the enormity of my crimes, whatever those crimes might turn out to be) to kill myself and spoil their plans for me.

Unfortunately I couldn't think of anything in my past worth killing for. It was embarrassing not to know what I was arrested for, but I couldn't do anything about that. I couldn't do anything much at all. Not only was the door locked, but there was very little in this tiny room to do anything with. There was a loudspeaker up high, behind a grille, that was playing music—violins, mostly; longhair stuff. There was a desk. It was absolutely bare on top, and what it might have inside its drawers I could not know. When I got up the nerve to just accidentally happen to tug at one of them it was as locked as the door. There was an unpolstered swivel chair behind the desk, and a straight-backed wooden one before it. No one was present to tell me which one I might sit in, but I took the wooden one anyway.

I sat, my arms wrapped around me against the cold, and thought.

And then, without warning, the door opened, and Chief Agent Christophe came in.

Chief Agent Christophe was a woman.

Chief Agent Nyla Christophe was not the only one through the door, but there was no doubt who was who. She was the boss. The others with her, two men and a plump, middle-aged woman, demonstrated that fact by body language.

It took me a while to get over the surprise. Of course, everybody knew

that the F.B.I. had begun recruiting woman agents a while earlier. No one would expect to *see* one. They were like woman taxi drivers or woman doctors; you knew they existed because when one did show up anywhere it got onto the newsreels and you saw it the next time you went to the movies. That wouldn't happen with the F.B.I. agents, of course. No personality story about an F.B.I. agent was ever going to turn up as a human-interest brightener in the weekly newsreel. Any cameraman who tried to do one would be in the soup—charged, probably, with something like reckless endangerment, for exposing a government operative to possible criminal retribution. Then he would turn up in an interrogation room in fear of his life. . . .

Very much like me.

Anyway, in she came. First there was a big guy to open the door for her, then Chief Agent Christophe, then the fat lady, then another big guy to close it. She glanced at me as she came in, abstractedly: Oh, yes, there's the piece of furniture that belongs in this room. I looked back at her with, I am sure, a lot more concentration. Nyla Christophe was a good-looking woman of a certain type. The type was big-boned and athletic. She had her hair tied behind in a pony tail, and pale blue eyes. She kept her hands folded behind her as she walked, in the style of a British admiral from the age of sail. She gave commands like an admiral. To the two huskies, "Tie him." To the plump lady who panted to the desk and pulled out a shorthand pad: "Write. August 17th, 1983, Chief Agent N. Christophe conducting interview of Dominic DeSota." To me:



“Make it easy on yourself, DeSota. Just give us the truth, answer all the questions and we’ll be through here in twenty minutes. First take the oath.”

That wasn’t good. To be put on oath right away meant that they were pretty serious. What I was going to tell them wasn’t just going to be information received in an investigation. It was going to be evidence. The stenographer-woman stood up and held out the books to me, wheezing the words for me to repeat after her. I stretched my hand from Bible to Koran, little finger on one, thumb touching the binding of the other, and swore to tell the truth, the whole truth and nothing but the truth, so help me God the Merciful, the All-Seeing, and the Avenging. “Fine, Dominic,” said Christophe as the huskies retied my right hand. She glanced at her watch as though she really thought we might get out of there in twenty minutes. “Now, just tell me why you were trying to break into Daleylab.”

I goggled. “Do what?”

“Break into Daleylab,” she said patiently. “What were you looking for?”

“I don’t know what you’re talking about,” I said.

It was not the answer Agent Christophe wanted to hear. “Oh, shit, Dominic,” she said crossly, “I hoped you were going to be sensible about this. Are you pretending you never heard of Daleylab?”

“Of course not.” Everybody knew what Daleylab was—or, anyway, knew that it was some kind of hush-hush military research place, way southwest of Chicago. I’d driven near it dozens of times. “But, Miss Christophe—”

“Agent Christophe.”

“—Agent Christophe, I really don’t know what you mean. I’ve never been in Daleylab. I certainly didn’t try to break in.”

“Oh, sweet Fatima,” she groaned, bringing her hands together for the first time. There was a surprise. Chief Agent Christophe would have had a little trouble taking the oath herself if anyone had asked her to. She didn’t have any thumbs.

It was not that unusual to see thumbless people, of course. It was a standard sentence for, like, second-offense thieves, or pickpockets, or sometimes an adultress or a death-by-auto killer. But it was quite unusual, I thought, to come across a thumbless F.B.I. agent.

It took an effort to get my mind off Christophe’s missing thumbs, but the ropes were cutting into my arms. “Agent Christophe,” I said, getting almost indignant, “I don’t know where you got this notion, but it simply isn’t even arguable. There is no chance I was anywhere near Daleylab in the last month or more.”

She looked at the two bullies, then back at me. “No chance,” she repeated thoughtfully.

“No chance at all,” I said firmly.

“No chance at all,” she echoed. Then she held out a hand.

One of the bullies filled it with a file folder. The top item inside the folder was a photograph. She glanced at it to make sure it was right way up, then held it before me so that I could see it clearly. It was a man at the door of a building.

The man was me.

He was me but wearing a suit I had never owned, a sort of one-piece coverall of the sort Winston Churchill made

famous in World War II. But he was me, all right. "This was taken," Christophe said colorlessly, "by the surveillance cameras at Daleylab night before last. So were these others." She flipped through them quickly. They were not all taken with the same camera, because the background was different from the first one. But it was the same familiar face, in the same unfamiliar clothes. "And these," she said, taking a cardboard form out of the folder, "are your fingerprints as filed with your college I.D. at Northwestern. The ones under them were found at the lab."

There were only four prints below the full line of of ten on the sample—all they'd recovered from the scene, I supposed. But even an amateur could see that the spirals and grooves on the thumb and middle finger of the right hand, and the index fingers of both, looked a lot like my reference prints above.

"But it's not true!" I wailed.

"Are you going to stick to your story?" Christophe asked incredulously.

"I have to! I wasn't there! I didn't do it!"

"Oh, hell, Dominic," she sighed, "I thought you had better sense." And she locked her thumbless hands together and gazed down at the ground. She didn't signal to her helpers. She didn't have to. They knew what came next and, as they moved toward me, so did I.

They didn't beat me very much. You know the gossip about how they treat suspects. By those standards they barely laid a finger on me. It isn't all gossip,

either, I think, because I wrote a mortgage for a bartender once, and then he got arrested on suspicion of selling hard liquor to a person under the age of thirty-five. He didn't need any mortgage after that. What his widow whispered to me about the condition of the body when they gave it back to her for burial would pretty nearly turn your stomach.

I got nothing like that.

I got slapped around. It hurt, sure. It hurts twice as much when you're tied up because you can't hit back—well, you wouldn't do that anyway, not if you knew what was good for you—or even try to catch some of the blows on the arm instead of the side of the head. My head was ringing long before they were through, but it was all open-hand stuff, no bruises, no breaking the skin, and they stopped every few minutes so Agent Christophe could pick up the questioning:

"That's you in the pictures, isn't it, Dominic?"

"How do I know? It—ouch!—*looks* like me, a little."

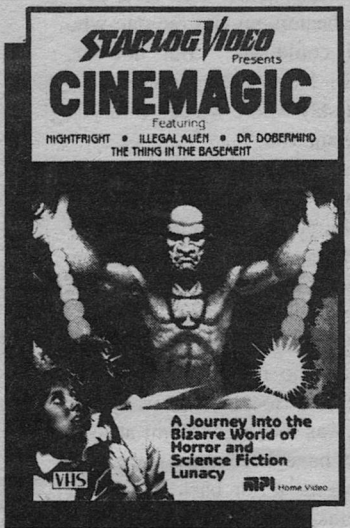
"And the fingerprints?"

"I don't know anything about fingerprints."

"Oh, hell, go on, boys."

After a while they got tired of the side of my head. Or maybe they noticed that I was beginning to have trouble hearing Christophe; anyway they began punching me in the belly or whacking me across the back. Since I was still wearing only the bathing suit there was no protection. It hurt. But hitting me on the back must have hurt their hands some, too, because they weren't nearly as enthusiastic. They paused more frequently:

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“Want to change your mind, Dominic?”

“There’s nothing to change, damn it!”

And then they’d switch to the belly again. That did hurt. It took the wind out of me; I doubled over and could hardly hear what Agent Christophe was saying.

And so I almost missed it when she said, “Jerk, are you still denying you were in Daleylab on Saturday, August 13th?”

I gasped, “Wait a minute.” Naturally they didn’t wait, just kept trying to get a good punch in at my doubled-over belly. “No, please,” I begged, and Christophe stopped them. I took a couple of deep breaths and managed to say, “Did you mean last Saturday? The thirteenth?”

“Right, Dominic. When you were caught at Daleylab.”

I sat up straighter. “But I couldn’t have been, Agent Christophe,” I said, “because last Saturday I was weekend-ing in New York City. My fiancée was there. She’ll testify. Honest, Agent Christophe! I don’t know who it was but it couldn’t have been me!”

Well, it wasn’t as easy as that. I took a couple of good shots after that before they were convinced—or not convinced, exactly, but at least confused. They got Greta out of bed to confirm my story, and she told them her whole crew would remember me, and they got all of them on the phone, too. They all did. I didn’t often go with Greta on her New York runs, and they were in no doubt about the date.

They untied me and let me stand up. One of them even loaned me a trench-

coat to put on over my bathing suit to go home in the bright dawn. They weren’t graceful about it, though. Agent Christophe didn’t speak to me again, just put her head down over the file folder, gnawing at her lips furiously. One of her beaters-up was the one who told me I could go. “But not far, DeSota. No New York trips, understand? Just stay where we can find you when we want you.”

“But I’ve proved I was innocent.”

“DeSota,” he snarled, “you’ve proved nothing. We’ve got all the *proof* we need. Surveillance photos, fingerprints. We could put you away for a hundred years with just that.”

“Except that I wasn’t there,” I said, and then said no more, because Nyla Christophe had looked up from her folder and was looking straight at me.

It would have been only decent of them to give me a ride back home, but I didn’t think it was worth while lingering long enough to ask. I found a cabby who took me, and waited outside while I went in to get my wallet and pay him off. Twelve dollars. A day’s pay. But I never paid a bill more gladly.

*And elsewhere in the news—*

Deputy Chief Inspector William Brzolyak, walking into his local precinct house with a .45 automatic in his hand, explained that he had shot and killed his wife and five children because they were staring at him behind his back. “They should’ve left me alone,” he told reporters.

Bathers along the South Side beaches complained that the presence of dark-brown, greasy balls of matter floating in the lake waters made swimming un-

attractive and constituted a possible health hazard.

The summer storm that dropped as much as 3.4 inches of rain on New York City suburbs within a four-hour period was described by U.S. Weather Bureau spokespersons as "a meteorological freak." It was not associated with any identified frontal system or low-pressure area. Property damage in Queens and Richmond counties alone was estimated in the millions of dollars.

August 18, 1983

11:15 A.M., Nicky DeSota

A day later none of it seemed so bad. "Just mistaken identity," I assured Greta when she called to say good-bye—she was on another New York run.

"Even the fingerprints?"

"Come on, Greta," I said, looking at my boss, who was looking thoughtfully at me, and at the clock behind him, which was telling me I only had two hours before I was due in traffic court. "You know where I was that night!"

"Of course I do," she sighed, in a tone of voice as though she wasn't really sure any more. I guessed that was what being questioned by the F.B.I. did. I could hear her yawning. "Goodness sake," she apologized, "I hope I'm not like this on my run. It was all that noise last night."

"What noise?" I hadn't heard anything, but then once I'm asleep I seldom do.

"That kind of roaring, didn't you hear? Sort of like thunder? Only there wasn't any thunder?—'scuse me," she added, and I could hear her saying something with her hand over the mouthpiece. Then, "Sorry, honey, but

they're loading up—I've got to go—see you in a couple of days—"

"I love you," I said, but I was talking to a dead phone. What's more, Mr. Ruppert was coming toward me, so I added swiftly, to the dead microphone, "I only wish I had a dozen more clients like you! Take care, and I'll get back to you with the quotations."

I hung up, gazing blandly at him, and bent quickly to the paper on my desk. I always keep a lot of it there for floor-time days. This time, though, it was actual work, quotations I had to prepare for clients in six different municipalities. Since each municipality had its own fire and safety codes—and thus its own insurance premiums—and since every client was different anyway in terms of credit standing and down payment—I had a good two hours with the adding machine. I had hoped for a nice lunch on the way over to Barrington, but I was lucky to get a hot dog and a root beer along the highway. I got there two minutes before the 1:30 P.M. on my ticket, which meant I was late. Not *late* late. The judge hadn't even shown up yet, and probably wouldn't for at least another quarter of an hour—that was what you got to be a judge for. But everybody else had been there long enough to hand in his ticket, announce his plea and get a number. I got a number. There were forty-two people summoned for that session. I was number forty-two.

I sat down in the back, calculating as best I could. Number forty-two. Say, at the most optimistic, an average of a minute and a half a case. That meant the judge would get to me in a little over an hour. Still, that wasn't so bad, I re-

assured myself, because I had a briefcase full of credit reports to check over. I could be sitting right there in the back row and catching up on my paperwork.

I opened the case, pulled out the first half-dozen folders and glanced around, reasonably well content. It was interesting to somebody who'd never been in traffic court before. The judge's bench was in a little play-pen sort of a thing, flanked by two flags. On the left was the old Stars and Stripes, the forty-eight stars bright on the blue background; on the right, the white of Illinois. Between them—

Between them was a sign on the wall. It said:

No smoking

No eating

No drinking

No reading

No writing

No sleeping

So the afternoon would not be as productive as I had hoped.

I tested it out by opening a folder, but the test came out negative. A fat, elderly guy in Barrington Police Department uniform came strolling down the aisle to watch what I did. There was no rule against having reading or writing materials out on your lap, it seemed; he didn't tell me to put them away. But you could see that he was waiting to pounce—one little stroke of the pen, one word scanned out of the corner of my eye and, pow!

I gave him a patronizing smile and turned to the citizen two seats away from me. "Hot in here, isn't it?" I asked. "You'd think they'd turn the fans on."

"Fans don't work," he said. That

was all he said. There wasn't any rule against talking, but he wasn't taking any chances. A voice from behind me explained:

"They work all right, it's just that this court's electric bills are getting too high." I looked around. Dapper young man grinning at me; he wore a white jacket, white pants, and next to him on a vacant chair was a white panama hat. A very flashy dresser, I thought. "It's hard to stay awake though, isn't it?" he added. "Especially when that noise keeps you awake all night."

That noise again. Again I said that I hadn't heard a thing, and both he and the guy in my row were glad to supply details. Like from the sky, see? No, not like an airplane—with an airplane you can hear the motors going; this wasn't a motor, it was more like something roaring—although, yeah, come to think of it, it did seem to come from around the airport. Midway? No, not Midway—that little private field off to the northwest, O'Hare they called it. And, boy!—that noise was *something*. On this all parties agreed—all but me, who had little to contribute but ears—and we probably would have gone on concurring for another half an hour if the court attendant hadn't called out: "His Honor Timothy P. Magrahan, all rise!"

And we rose. His Honor came in, sweating in his dollar-ninety-eight black judicial robes, gazing out at us like an actor counting a sparse house, without much pleasure. When we were allowed to sit down again he sighed and gave us a little speech:

"Ladies and gentlemen, most of you here today have been accused of traffic offenses. Now, I don't know how you



people feel, but to me this has to be taken seriously. A traffic offense isn't some little thing that doesn't matter much one way or another. Not at all. A traffic offense is an offense against driving. An offense against driving is an offense against the good people who make our driving possible—our friends from the Middle East, including Mekhtab ibn Bawzi himself. An offense against our friends from the Middle East is an offense against the principles of religious toleration and democratic friendship among peoples. . . .”

It was not a surprise to me when the snappy customer in the white suit whispered in my ear that Judge Magrahan was coming up for reelection that November. By the time the judge got around to telling us that an offense against the Q'ran was an offense against religion generally, including our own Judaeo-Christian denominations, I began to see that this traffic ticket could be serious. My only hope for getting off scot-free would have been if the summoning officer hadn't shown up in court. That wasn't happening. There was a bench along the side of the room, and among the five or six men sitting there—a couple in State Police uniforms, the others from various municipalities—there was my good friend from Meacham Road. He knew I was there, too. He didn't smile at me, or nod, but I could feel his eyes on me from time to time.

The first case came up for decision, a scared-looking young woman with a baby in a stroller, sixty-eight miles an hour in a 60-mile-an-hour zone. \$25 fine and six months' probation. The second case was worse, driving under the in-

fluence of alcohol, third offense, along with reckless endangerment and failure to observe posted stop signs. That was a man of no more than twenty, and he did not leave the courtroom under his own power. One of the officers took him away in handcuffs, to be held awaiting sentencing, and as he left I could see him looking at his thumbs wistfully, as though he didn't expect to have them much longer.

I sat up straighter and put my briefcase away. Most of the people in the courtroom were doing the same thing. It seemed that Judge Magrahan's political strategy had been set: losing votes among the people he sentenced would cost him less than those he would gain by working up a reputation as a fearless crusader for traffic safety.

There was also the consideration, I realized, that most of the persons awaiting hearing came from other municipalities, like myself, and therefore were of no interest to the judge's vote counters.

So I watched for half an hour as the justice meted out justice to his subjects, one by one. I decided that it wasn't my month. Chief Agent Nyla Christophe was bad enough, but at least I'd been able to clear myself with her. With this judge, I had no hope. I watched my acquaintance in the white suit wander around the courtroom like a friend of the family at a picnic, stopping to chat with this one and that. When he leaned over to whisper in the ear of the cop who'd summonsed me I began to pay closer attention. When the cop glanced at me, shaking his head, I sat up straight. When, a couple of minutes later, the two of them walked out of the courtroom together, still talking, I al-



most got up to follow; but the courtroom attendant who had so faithfully monitored what I was doing with my briefcase stood at the end of my row, watching me assessingly. I stayed put. For a while. When a few minutes later curiosity overcame caution it was too late. "Men's room?" I whispered to the attendant; he nodded; I went where he pointed; neither cop nor man in white were in sight anywhere around.

And when, half an hour later, the clerk at last called my name, the judge conferred in whispers with another court attendant, then scowled at me. "Mr. DeSota," he said, "your summoning officer has been called away on urgent police business and cannot testify against you. Therefore, under the law, I have no option but to dismiss the charges. You're a free man, Mr. DeSota, and, I may add, a very lucky one."

I did not disagree at all.

I was so pleased to be out of it that I was halfway gone before I realized my beeper was beeping. I stopped at a filling station and while the high-test was running into my tank I called the message center. This time they had tuned me in exactly and the operator had every word of the message. So, this time, it was the message itself that left me bewildered. Pronounced syllable by syllable with care, it said:

"You don't need to know my name and you don't need to know why I care what happens to you or how I know who you are or anything like that. But if you want help with the thumbless lady, have a tunafish salad sandwich at the Carson, Pirie, Scott coffee shop this evening at six P.M."

"That's it?" I asked.

"Yes, sir," said the operator, very sweet, very competent. "Would you like me to repeat the message? No? Then just let me say, sir, that it's the occasional message like yours that makes this job such a fun thing to do! Thank you, Mr. DeSota, thank you very much."

"You're welcome," I said, and sat there, staring out the windshield until the gas jockey rapped on my window. "Sorry," I said, and fished out the money to pay him—sixty-nine cents a gallon! If I'd looked at the prices I never would have stopped there.

But I didn't have room in my head to think about that; I was too busy thinking about the message. *And* the mistaken identity thing with the F.B.I. *And* getting off so lightly in the traffic court. *And* all the other weirdnesses that were infesting my life and the world. Under normal circumstances I would have ignored the message. It was exactly the kind of cloak-and-dagger thing that a sensible person would stay far away from. Taking time off to go there would, as a minimum, mean taking off more time from my main business in life, namely the arranging of mortgages for needy homebuyers. The boss would not be pleased. And the whole thing was fishy. Going there might easily get me in trouble I couldn't get out of.

Naturally I went.

There was a novel that Greta and I were reading once where one of the characters said something like, "She went into a department store, one of the places where women gladly go but few men are willing to follow." Greta said she thought that was sort of derogatory

toward women. "Women don't *like* to shop," she said. "It's just that they *have* to. They're the ones who buy the groceries and the household furnishings and all the other things people have to buy for a family."

"They don't buy the cars," I pointed out.

"No, of course. They don't buy the major capital expense items, naturally," she agreed. "But that sort of thing you only do once every few years. Day in, day out, there's all the consumable stuff that has to be bought. If a woman spends a lot of time buying it, that's because it's her job. To compare prices and values. It's how she conserves her family's spending money. Whether she likes it or not doesn't matter. She has to do it anyway."

"Right, honey," I said, grinning.

She didn't like the grin. "No, Nicky, I'm serious! You shouldn't say women *like* to shop. You should just say it's their *job* to shop."

"Now, Greta," I said reasonably, "just think this thing through, will you? How can you say it's derogatory to somebody to say she likes to do her job? I like my job too."

"That's not at all the same thing," she said, but she didn't say it angrily, and then she changed the subject. She was good about that. Greta was not one of your suffragettes. She told me a hundred times that if she got the vote she wouldn't know what to do with it. But the thing about Greta was that she had a good job as a stewardess, and it made her a little—well—I don't want to say mannish or anything like that. Not independent, exactly. And it was all conversation, of course; if I ever

popped the question I knew what she would say, and once we were married there'd be no more of those funny ideas.

I did worry about her a little now and then, though.

Right then my worries were a lot more immediate. What made me think about all this was that, looking around the Carson coffee shop, I felt that line from the novel was right on target. There were a hundred customers scattered around the big room—green porch furniture for tables and chairs, hanging plants everywhere—and ninety-five of them were women. There were no single men, or pairs of men. Here and there a couple, maybe, the man generally elderly, and always with that hangdog *Oh-my-God-I've-blundered-into-the-ladies'-toilet* look.

I guess that was why I assumed that my Mystery Caller would be female. That shows how reliable my assumptions are.

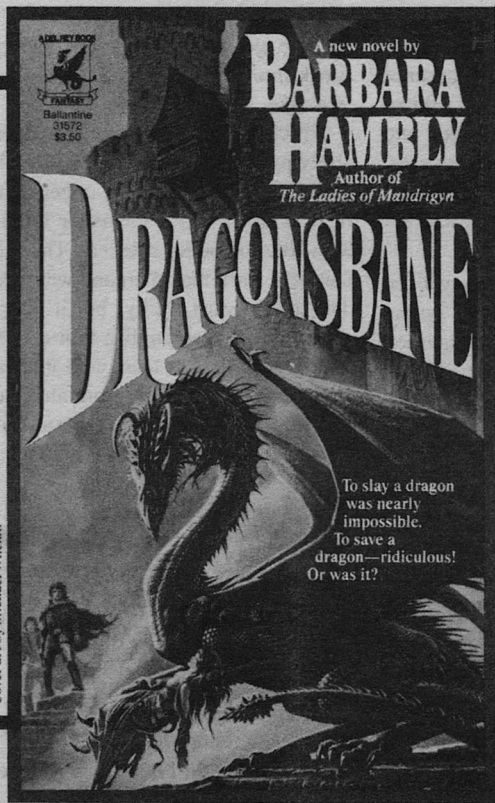
After twenty minutes, and the third time the elderly waitress came by to inquire if I was ready to order, I was. After another twenty minutes my tuna-salad sandwich arrived.

And twenty minutes after that—after I had eaten half the sandwich and was trying to make myself leave the other half on the plate as a recognition signal—I felt someone pass rapidly behind me. When I looked up there was a man already seated across the table.

I knew him. He wasn't wearing a white suit, but he had been not too many hours earlier.

"Well, hello," I said. "I might have guessed it was you."

The waitress was hovering nearby; he glanced at her, then frowned meaning-



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fully at me. "Hello, there," he said—his tone that of two old business acquaintances, not in the least surprised to have run into each other this way. But, if he knew my name, he didn't use it. It was, "Long time no see," and, "How *are* you, then?" and no nonsense about waiting for me to answer. When the waitress had taken his order and gone off with it he said in a conversational tone, "You weren't followed here. There's nobody in the restaurant watching you. We can talk."

There is just so much mystery I am willing to put up with. I picked up the other half of my sandwich and regarded him over a bite of it. Youngish fellow, two or three years younger than I. Open-faced, freckled, sandy-haired—the boy next door, the one you knew would never do anything mean or sneaky. Except that here he was being a sneak. "What are we going to talk about?" I asked, my mouth full of tuna-fish and cracked-wheat toast. "And who am I talking to, then?"

He made an impatient gesture. "Call me Jimmy. Names don't matter. What matters is, what were you trying to do at Daleylab?"

"Ah, Jimmy," I said sadly, and put down the rest of my sandwich. "This is stupid," I said. "You go back and tell Chief Agent Christophe that the trick didn't work."

He frowned at me for silence while the waitress brought his ham and cheese sandwich. Then, "There's no trick," he said.

"There's nothing *but* a trick, Jimmy. I was never anywhere near Daleylab, and you and Christophe better know it."

"Don't jerk me around," he grated. "They've got your picture."

"It's a fake."

"Fingerprints? They fakes too?"

I said steadily, "Anything at all they've got that says I was trying to break into Daleylab last Saturday night is a fake, because I wasn't."

He chewed on his ham and cheese, studying me suspiciously. I studied him back. Not only was he younger than I, he was taller and a lot better looking. A whole lot better dressed. The white suit he'd worn that afternoon was flashy. This one wasn't flashy, but it was cut nicely out of real English fabric—seventy-five dollars at least, and matching shoes that hadn't come from any Thom McAn I ever saw. He said suddenly, "Nyla thinks your alibi witnesses are lying."

I'd started to pick up the rest of my sandwich. I put it down again. "How do you know what Nyla Christophe thinks if you're not F.B.I.?"

"We're friends," he explained. "I've got a lot of cop friends—not just in the F.B.I. You ought to know that."

"I know what you did," I said. "I don't know why you did it."

"Why shouldn't I do a favor if I want to?" he demanded. "Get back to your witnesses. Are they lying?"

"No! If they were, would I tell you? But they're not."

He chewed the rest of his ham and cheese in silence, keeping his eyes on me as though some change in expression might resolve the problem for him. I let him keep his quiet. I finished my own sandwich, drank the last of my coffee, waved the waitress over for a refill. He tapped his cup for the same, and when

she had gone away again he said, "I didn't think they were, actually."

"I'm glad to hear that."

"Oh, don't come on supercilious crap with me, Dominic. You're in trouble up to your ass, you know that?"

I hadn't known that. "Christophe told me I could go home!" I objected.

"Why shouldn't she? You couldn't get out of town if you tried. She's not through with you."

"Why not, damn it?"

"Because," he explained, "photos and fingerprints don't lie."

"But I wasn't there!"

He said slowly, "I swear, I think you mean it. I think your witnesses mean it, too, and that's pretty hard to swallow. I think you people might even pass a lie-detector test."

"Why not? We aren't lying."

"Oh, hell, Dominic!" he exploded.

"Don't you know you need help?"

"Are you going to help me?" I asked.

"Me? No," he said. "But I know somebody who might. Pay the check, Dominic, and let's go for a ride."

Around this time in August the sun doesn't go down till eight or so, but it was already full dark before we got to where we were going. There wasn't much traffic, once we got out of the Chicago suburbs heading south. We went past cornfields by the mile and small towns by the dozen, and every time I asked this Jimmy person where we were going he only shook his head. "The less you know," he said, "the less trouble you can get anybody in."

"When are we going to get there, then? I'm not a night owl, Jimmy, and

I've got a job, and they expect me to be working in the morning—"

"What you've got," he said patiently, as he slowed for a light, "is trouble with the F.B.I. If you don't get that straightened out no other trouble is going to matter."

"Yes, sure, Jimmy, but—"

"But quit your bellyaching," he ordered. "We're just about there. It's right outside this town."

"This town," according to the sign on the road, was called Dixon, Illinois, population 2250, Rotary and Lions Club met every Thursday and Friday in the Holiday Inn. We turned off the main street at a square with a World War II 75-millimeter cannon in a little green patch, drove a few blocks, and then Jimmy took a tire-whining left into a private road.

Who the road belonged to it did not declare. There was no cute little "Welcome to Hiddenwell Acres" sign, no name, nothing to identify it and certainly nothing to make us feel at all welcome. On the contrary. What distinguished this road from any other around was the swinging gate barrier that blocked us at the first turn. There was a little wooden guardhouse next to the gate, and out of it leaned a large, non-wooden guard. "I.D.," he ordered. Jimmy passed him something. What it was I knew not, but it satisfied him. Well, it almost satisfied him. He pored over it for a while, licking his lips. Then he picked up a phone and discussed it with someone on the other end. Then he cranked the barrier up and waved us through.

A quarter of a mile farther along, the road split to loop around a lawn with

a fountain. We circled and stopped in front of a veranda with huge white pillars. I'd seen it before—in, I think, the movie *Gone with the Wind*. And the servants came out of the same film. A cheerful young black man came at us from one direction to bob his head and take Jimmy's car to an invisible parking lot behind a grove of apple trees in fruit. A plump, middle-aged black woman came from another to admit us to the house. She didn't greet Jimmy by name, and didn't pay any attention to me at all. She didn't ask questions. She didn't volunteer any answers. The list of things she didn't do was, in fact, very long; what she did do was lead us silently, through a huge three-story foyer with a carpeted stairway curving down to the entrance, through a passage, through a little sort of living room, with a fireplace and comfortable couch and armchairs, all unoccupied, through a glass door into, finally, a sort of combination hot-house and gymnasium. It had been hot enough outside. It was twice as hot within. The place was full of tropical plants stretching up to the glass roof, with vines clinging to the trees and a sort of general jungly smell of decaying plants and humid soil.

In the middle of it all was a swimming pool, long and narrow. And in the pool was an elderly man; and on the elderly man was nothing at all. He was skinny-dipping. It did not seem to concern him. He was doing laps. He splashed to our end of the pool, gasped, "Ninety-eight," swam a sort of sloppy Australian crawl to the far end—"Ninety-nine"—did the last stretch back to us at top speed, arms slipping gracefully into the water ahead of his white topknot, feet frothing up

the water behind in a vigorous eight-beat kick. "One hundred," he panted, and clung to the edge of the pool. Another young black man, this one grave rather than cheerful, handed him a towel, and he dabbed at his face and grinned up at me. "Evening, gentlemen," he said.

I made a noise at him. It wasn't exactly a "Good evening," but it was polite. Jimmy did better. He crouched down beside the pool, took one of the old swimmer's wet and slippery hands and pumped it enthusiastically.

"Ron," he said, from the heart—anyway it sounded as though it came from the heart—"I can't tell you how grateful I am to you for seeing us tonight."

"Not at all," said the man courteously. "After all, Larry, you said it was a significant civil liberties issue."

"Yes, I think it is," said "Jimmy" gamely, carefully not looking to see if I'd picked up on the name. "It's about Dominic here. He has an unusual problem with the F.B.I. They claim he was detected breaking into a secret government research installation. They have pictures and fingerprints to prove it. But he has unimpeachable witnesses to prove he was a thousand miles away at the time."

Ron had pulled himself out of the pool and was toweling himself dry. He had to be in his seventies, anyway, but when I looked at his tapering torso and absolute lack of any spare tire around the waist, I only wished I could live to be that kind of seventy. He not only looked good, he looked sort of familiar. Then he finished drying himself, dropped the towel on the tiling and let the black

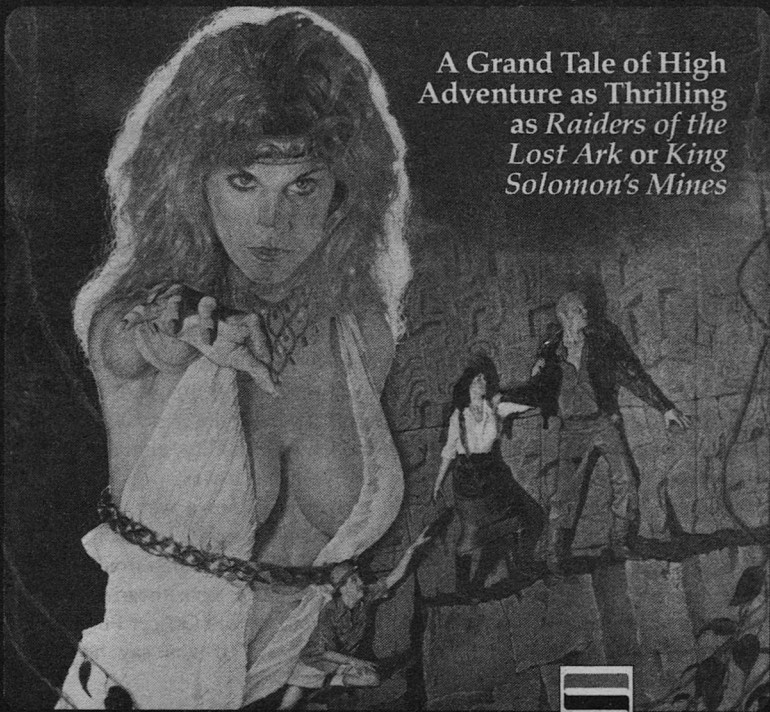
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a secret that will set the world afire...

**RICHARD MONACO**

BESTSELLING AUTHOR OF *PARSIVAL*

# JOURNEY TO THE FLAME

A Grand Tale of High  
Adventure as Thrilling  
as *Raiders of the  
Lost Ark* or *King  
Solomon's Mines*



A BANTAM **SPECTRA** BOOK

man help him into a white terry-cloth robe. "I don't do private-eye movies any more, Larry," he grinned, and I realized why he looked familiar. He was an actor. Had been an actor, anyway. In the movies. Never a big star, but one of those faces you kept seeing until your subconscious remembered it even if the rest of you didn't—until there was some kind of scandal. Scandal? Trouble, anyway. I couldn't remember the details, but he had been fired. Not just from the job. From the industry; it had been something political, maybe. . . .

Whatever it was, it had happened a long time ago. Right after World War II, right about when I was getting ready to get born; and now old Ron was easily in his seventies and maybe a little more than that. A nice looking old man, even not counting the slim waist and square shoulders, with an engaging grin and a lock of white hair that kept falling down over his eyes.

So he looked.

Old Ron didn't linger by the pool. He led the way to the room with the couch and chairs. In the five minutes since we passed through it last someone had lighted a fire in the fireplace and put out glasses and bottles on a sideboard. A third young black man, perhaps the fire-layer and drink-setter-outer, materialized to take our drink orders, while Ron sat in the armchair nearest the fire, raising his bare feet to the warmth of it by resting them on a hassock. You remember it was August? I could understand that his little tootsies might be cold, but surely there was some better way of warming them than by heating up the whole damn room.

When we all had our drinks, he raised

his in a toast, swallowed half of it briskly, and then gave "Jimmy" and me that engaging grin again. "Well, Larry," he said, "what kind of hopeless incompetent have you brought me this time?"

*And elsewhere in the news—*

WGN's switchboard was suddenly flooded with calls in the middle of a Cubs game. Every call was a complaint, and every complaint was the same. The broadcast had been drowned out in the top of the third inning by somebody describing a *football* game. The complaints were less urgent than the curiosity: who in the world had ever heard of professional football in *August*?

August 19, 1983.

9:15 P.M. Larry Douglas.

A person in my line of work needs to keep his eyes open. See, I don't have a paycheck every week. There are plenty of weeks when I have a big fat zero, and some when I wind up minus. So I have to make a dollar wherever I can find it, whenever a chance turns up.

When Nyla told me about the poor sap she'd picked up the night before, the way Nyla tells me so many sometimes very useful things, I decided I'd better take a closer look at him. I smelled a possibility, although I wasn't sure yet what it was.

There's always a way to check out the chances if you look for it, and this one was easy. It was no trouble to drop in on his traffic court hearing—and no big deal to get old Officer Pupp to drop the charges. "If you say he's okay, Larry—"

"I do."



“Then I’ll just tell the clerk I had to get back on duty. But tell your pal to watch himself next time.”

“I will,” I said, and slipped him twenty as we shook hands. That’s just a normal business expense for me. In my line of work you want to stay friendly with the cops. It might not keep them from busting you now and then, but at least they probably won’t do you any third-degree stuff.

As Mom used to say, I probably take after Grandpa Joe. He was the bank robber, before he came to America and changed his name. Of course, he used a gun. I don’t do that, ever, but then when people are so trusting about buying guaranteed flawless diamond rings on a street corner, or investing in warranted sure-to-double-in-value oil stocks over the counter, I don’t have to. Unless one of them catches up with me. And as long as I’m tight with Nyla Christophe, that’s not likely to happen without at least a little advance warning. So I keep her sweet, in all the ways I can and—honest—I’ve got some really good ones.

I keep the Arabs sweet, too, though not in exactly the same way. There are places where I have to draw a line, so I don’t do that with them. Any more. . . . Well, the other part of that is that they really like their boys younger than I am now, anyway.

Sometimes I think I’d like it better if I were straight, but then I live in the world I’ve got.

So when I saw what the wimp was into I got the inspiration to get Ron involved. I’ve kept him sweet, too—a kind of investment, figuring that sooner

or later there was a way to make it pay off. When he insulted the wimp, DeSota, I knew I was all right. See, Ronnie’s really a mean-natured old grouch, but if you know how to handle him he’ll do almost anything. I know how to handle him. “Ron,” I said—grave, serious, open-minded—“you’re right. I should have seen it for myself.”

He twinkled at me over his Scotch, one eyebrow humorously cocked the way he did. “What am I right about, Larry?” he asked. It was a really nice twinkle. They’d taught it to him back on the MGM lot in the old days, before he got involved in unions and stuff like that. You didn’t want to rely too much on the twinkle or the grin, though, because the grin came off like the shutters off Admiral Nelson’s gunports, and then *boom* you were shot dead.

“You’re right,” I said, “that Nicky DeSota here is a turkey who got himself into trouble with the F.B.I., and I had no right bringing him down here to ask you to get him out of it.”

Of course, DeSota’s jaw just about hit the floor. But Ron’s jaw was the one that counted. It jutted out. The eyes narrowed. The whole face took on the steely look of the marshal who’s just heard the outlaw didn’t leave town after all.

“I think,” he said firmly, “that you ought to tell me what’s up, and let me make that decision myself.”

“I don’t want to cause trouble for you, Ron.”

“Trouble, Larry, is something I’m used to,” he snapped, and I could almost see him trying to catch a reflection of himself in the French doors.

What could I do? Exactly what I

wanted to do, of course. "You're right, Ron," I said, and began to fill Ron in. It took time. Ron is not what you'd call swift. Neither was DeSota. Out of the corner of my eye I could see him glowering at the floor, but he didn't look up or say anything.

And, actually, he had nothing at all to complain about in the way I told his story for him. I explained that it was a clear case of mistaken identity, although the person detected at Daleylab was Dominic's twin, as far as all appearances went. Then I paused, while Ron signaled for another round of drinks, and sat for a moment to take it all in.

"This other guy looked just like him, right?" asked Ron, double-checking.

"Just like him, yep."

"And had the same fingerprints?"

"That's right, Ron."

"But it wasn't him," he finished.

I nodded.

"Then," said Ron, alertly summing up, "it was a clear case of mistaken identity, as I see it."

I gave an admiring little shake of the head, glancing at Dominic to nudge him into doing the same. Dominic wasn't having any. He didn't say anything, but the look he gave me was icy cold. He was not at all pleased with me, Dominic DeSota, but he just didn't understand how you get along with old Ronnie.

Ronnie stood up. "Larry," he said, "you and Nicky will stay for dinner, of course." Of course. It was after ten o'clock at night! Only an ex-movie star would keep hours like that. "Just take it easy while I throw some clothes on, all right? If you'd like some music, just tell Hiram here to switch on the stereo."

And he left us to make up, a task I did not think would be easy.

"What the hell were you trying to pull?" demanded DeSota, as soon as the old man was out of earshot.

I soothed, "Now, just take it easy. Don't you see what I was doing?"

"I hope not!"

"I was getting him on your side, that's all," I explained. "See, Ron's a deep-dyed liberal. He's committed. Unshakable. He was blacklisted in Hollywood, years ago, for union activities, and—"

I stopped, because the young black man was back in the room. "Some music with the Missus's compliments, gentlemen," he murmured, and disappeared again. Some kind of long-hair music came out of hidden speakers, not too loud. I was glad for it; it made it less likely that anybody would be listening to what we said. "Anyway," I finished, "he was lucky. He put his movie earnings into Illinois real estate, and wound up rich."

Dominic was frowning. "Did you say liberal?"

"Yeah, but in his case it's all right, Nicky, because he's rich. Nobody minds a rich man being a little bit of a pinko—they know he won't do anything against the way things are."

"So then what's the use of being here?" he demanded.

"Because if Ron takes an interest in you, he can help you a lot. You got any other offers?"

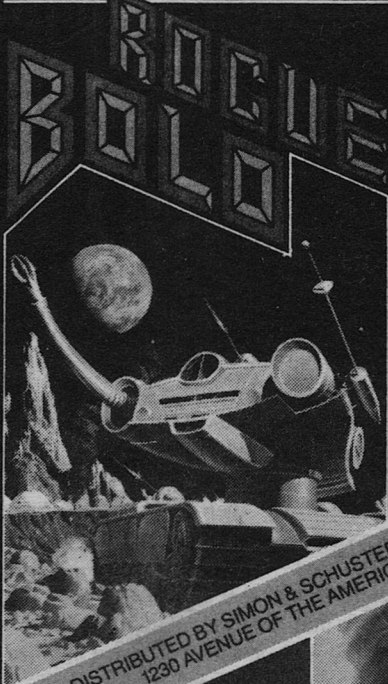
He shrugged morosely.

I left it at that. I hadn't told him that the other reason nobody minded Ron being a little lefty in his politics was that

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"GRANT CALLIN'S UNIVERSE IS A FASCINATING ONE.  
I LOOK FORWARD TO SEEING MORE OF IT."

—LARRY NIVEN

nobody minded a pinko who was all talk and no action. And that was Ron.

But I wasn't ready for Dominic DeSota to find that out yet.

"This," said Ron gallantly, "is my dear wife Janie."

"Charmed," she said, when DeSota and I had told her how glad we were to meet her, and then she and Ron led the way into the dining room. It wasn't big. A room that can seat maybe twenty people is big. This one could have served as messhall for the Grand Army of the Republic. It was *huge*. And around us the music swelled.

I called across the table to Dominic, "You like the sound?" He was turning his head this way and that, the way people do when they haven't heard stereo before. "It's a new system," I explained. "Just listen to that sound. Hear how the violin sounds like it's on one side of you and the rest of the orchestra on the other? Ron's had this stuff for over a year now."

"It'll be on the market for everybody before long," Ron said modestly. "The only thing is that they don't make very many stereo records yet—and most of them more Janie's kind of music than mine." He grinned uxoriously down the long table to his wife, at the far end. She signaled yet another of the young black men to begin serving the salad before she picked up the conversational ball.

"I suspect Mr. DeSota likes the same sort of music I do," she offered sweetly. "Isn't that true, Mr. DeSota? You're obviously enjoying the Beethoven violin concerto."

But Dominic wasn't playing in their

game. "Is that what it is?" he demanded. "Actually, I was thinking it's the same piece Chief Agent Christophe was playing while she was questioning me."

Ron dropped his salad fork. "Nyla Christophe! You didn't say Nyla Christophe was involved here, Larry!"

"I guess I should have," I said, all open-faced and contrite. "Does it make a difference?"

"A difference! Jesus—I mean, gosh, Larry, of course it does!"

"She can't do you any harm any more," his wife called down the table.

"That's not what I'm worried about! I'd like to do her some! Nyla Christophe," he said, turning back to Dominic, "is one of the worst agents in the F.B.I. Did you notice she doesn't have any thumbs?"

"You bet," said Dominic. "I wondered how come a—"

"I'll tell you how come," Ron grated. "Shoplifting! Then dope! She had three convictions before she was twenty-one years old—third time meant loss of thumbs, and that's what she got. She was a music student up till then, but she got hooked on the killer weed and had to steal to support her habit!"

"And she got into the F.B.I.?" Dominic demanded, pop-eyed with either wonder or indignation.

"She got religion!" Ron roared. "She went to the local office before the bandages were off her thumbs! Said she'd been born again, and she wanted to turn in every marijuana dealer and fence she knew in Chicago—and, believe me, she knew plenty of them! They kept her busy fingering and testifying for a year, then the old bureau

chief, Federman, he got a special waiver for her to go on salary to infiltrate a bunch of union organizers in Dallas. They got fifteen convictions there, and Nyla was on her way!"

"In a way, Ron," I offered, "it's pretty impressive that somebody like her should make it to Chief Agent."

"Because she's a felon? Gosh, Larry! Where do you think they get most of their recruits?"

"No, I mean because she's a woman," I said.

"Yeah," muttered Ron. "Well—" He was in a bind there, I knew, because Janie was all for "women's rights," whatever she meant by that. "Well," he said, "the thing is, whatever else she is, what she is now is part and parcel of that whole reactionary gang that's running the F.B.I. The same ones who framed me, years ago! The ones who're hand-in-glove with the Arabs and that whole fundamentalist bunch in Congress that—"

Dominic interrupted him then. I could have punched Dominic out for doing it, because Ron was just getting to something I really wanted to hear, but Dominic couldn't wait. "Just what I say!" he cried. "Ever since the Arabs and the Moral Majority got together they've been turning the clock back! Why, do you know, at my local swimming pool they let the state police come in and raid? Any man who's caught without the top to his bathing suit can get a five-dollar fine!"

Ron darted a humorous glance at his wife. "Should've seen us a few years back in Hollywood, eh, Janie? Men *and* women topless sometimes—and sometimes a lot more than topless."

"Now, Ron," she blushed. "Let's just try to concentrate on Mr. DeSota's problem."

I said gratefully, "Thank you." Then I turned to Ron and put the question: "What do you think, Ron? I know this is a serious matter, even if a principle is involved. I don't want you to take any risks—"

Ron looked noble. "It's a serious matter," he declaimed, "and a principle is involved. I'll help you, Dominic."

"You will?" cried DeSota.

"Of course," said Ron benignly. "First thing, I'll write a letter to the *New York Times*. Then, let's see, what do you think, Janie? Shall we try to get a demonstration going? Get some of your friends to march in front of the F.B.I. headquarters in Chicago?"

"If you like, Ron," she said, "although some of them are on peace bonds now. I don't know if they'll want to go to jail."

Dominic looked doubtful. "I don't know if I want anybody to go to jail for me," he said.

"Um," reflected Ron. "Then how about this? Get up a petition? Dominic can take a card table and a folding chair down to the Loop somewhere and get people to sign a demand that the F.B.I., uh, that they— What exactly do you want them to do?" he asked.

"Well, I don't know exactly," said Dominic. "I mean, I'm not charged with anything."

"But they interrogated you! Beat you brutally!"

"Yes, sure, but you can't blame them altogether. They did have those pictures and fingerprints."

This man was being entirely too rea-

sonable for my taste—or for Ron's. "You're sticking up for them," said Ron. "Shows fair-mindedness. That's good—but don't carry it to any foolish extreme! They're still fascists."

Now, that was more like it. I cleared my throat, "When you say 'fascists,' Ron," I said, "you mean—"

"I mean that the F.B.I. has turned itself into an exact copy of the Gestapo or the K.G.B.," he declared.

"You're against them, then?"

He cocked an eyebrow at me. "Ah, Larry," he said, helping himself to the roast lamb, "I'm not just *against* them, I think it is every American's duty to *resist* them."

"You mean with demonstrations and petitions," I pressed.

"If those are enough, yes," he said bravely. "If not, then with whatever measures are necessary. I think—"

But Janie didn't want him to say what he thought. "Ron, dear," she scolded fondly, "you're keeping Seth from passing the potatoes. Why don't you take some and let him move on?"

"Of course, my love," said Ron, and the subject was changed. It didn't matter. I was content. As soon as we'd got through the main course I discovered that it was past eleven o'clock, and began organizing DeSota for the return trip.

"Oh, no, Ron, no dessert. No, not even coffee, thanks. Dominic here has to work in the morning, you know. Yes, the dinner was lovely, and thank you! And thanks for your help, Ron . . . and if you'll just get my car out. . . ."

"You haven't forgotten anything?" asked Jane hospitably, looking around for hats or briefcases.

I shook my head. "I've got everything I need," I assured her, and it was the absolute truth.

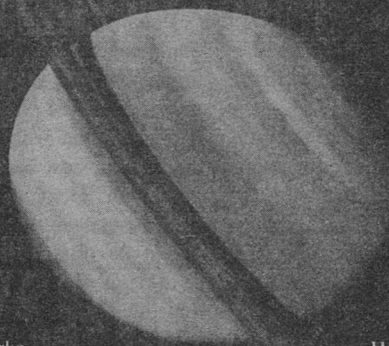
I dropped DeSota at an interurban station. He squawked resentment, because they only ran every hour or so at that time, but, as I pointed out to him, it was getting late and I couldn't be expected to give the *whole* night to saving his dumb ass. It was nearly two when I got to the compound on Lake Shore Drive. I left my car in the underground garage, flashed my pass to the guard, and got in the elevator. I was thinking about Ron. Poor old guy! Just out of touch with the modern current of politics in America. He had some crazy, sentimental notion about Franklin D. Roosevelt or somebody—I don't know—anyway he simply didn't understand what was going on.

The thing I always tried to keep in mind was that I could've been some kind of pinko myself, if Gramp had kept his principles when he came to America. Back in Russia he was a bank robber and a revolutionary. When it got too hot for him there he came to Ellis Island, still hanging on to some of the profits from the bank robberies, but leaving all the revolutionary ideas behind. That's how J. Douglas & Sons got started; and J. Douglas & Sons is where the money came from to put me through Yale. But suppose Gramp had had to leave the rubles behind and skedaddle out of the country with nothing but a lot of half-baked political ideas, like his buddy Lenin? And what would I have turned out to be, without those good poli-sci courses in Yale to keep me straight?

Straight as a string, I let myself into

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the big studio apartment on the fourteenth floor. There were no lights, but the shades on the big picture window were wide open and enough illumination seeped in from the street for me to undress and slip into the bed. I put my arm around my girl, cupping a breast, and whispered in her ear. "Nyla, sweet?"

She woke up easily and fast, as she always did. Her voice wasn't even thick as she asked, "How'd it go?"

"That," I said, bringing another hand to bear, "you can judge for yourself when you hear what I got on my wire recorder."

She turned toward me, nuzzling into my neck. "Are you going to play it for me?"

I said, "Why, yes, honey, I absolutely am. But first there's some other business I'd like to take care of, if you don't mind making a quick trip to the bathroom first. . . ."

She lay relaxed in my arms. "Not necessary," she said. "After all, I knew you were coming, so it's all taken care of in advance. . . . And I see you're ready, too." And so I was. If I hadn't been when I slid into the covers, I was by now. Lacking a couple of thumbs had never been a handicap to Nyla Christophe, in bed or anywhere else.

There was a bad time in eastern Iowa. Farmers who through adversity were used to flood, drought, and legislative tinkering with their price supports woke to a new disaster. From Muscatine to the edge of the Quad Cities, twenty miles and more, the sky was covered with a green-gray, oily cloud. When the cloud settled it blanketed three-quarters of a million acres of prime corn, soy,

and mung with a carpet of locusts. Locusts! No one in Iowa had ever seen a locust swarm before! And when they rose to fly on, only stubble remained.

August 21 1983

4:50 P.M. Nicky DeSota

When you're a mortgage broker you don't have any Sundays. Sundays are the days when your customers are off work, so if you want to get the breadwinner at home with the housewife Sunday is your best bet. It was a beautiful day, with fleecy white clouds sailing over the trees of the Mekhtab ibn Bawzi Forest Reserve and the pool sparkling at me as I drove past. No pool for me that day. No church. No sneaking off to watch the Cubs game. No anything but calculating down payments and points and the pitfalls in transferring a torrens title; I didn't even get a chance to look at the Sunday paper until almost five o'clock that evening, and that on the interurban down to the city. I caught the 4:38 out of Elk Grove, grabbed a paper from the butcher on the platform as the train began to move off and spent ten minutes on the really important news stories—you know, the ones in the sports section, about the Cubs and the Sox and how far ahead the Brooklyn Dodgers were in the standings. With only about a month left to play, the Cubs were ten and a half games out. The situation wasn't impossible, no. But it didn't justify a lot of time spent poring over the standings, so before long I turned to the main news section.

Now, of course I hadn't forgotten that crazy drive down to Dixon. I guess I really hadn't been worried about my own position before that. Scared, yes.



You can't help being scared when the F.B.I. gets hold of you. But not *worried*, because after all I knew that I wasn't there and I had plenty of witnesses to prove it.

So, in a way, it was Ron's big hot-air promises to help me that really started me worrying. I kept waiting for the phone to ring and, I don't know, some radio news reporter from the NBC Blue network or somewhere to ask me what my feelings were about the demonstration in Chicago that day.

Well, there hadn't been any calls. There hadn't been any demonstrations, either, or at least none that made the first couple pages of the *Tribune*. The big news story was about President Daley coming back to Chicago to break ground for his library—that was the *Tribune* for you. (A tiny box at the bottom of the page told about renewed fighting between Lithuania and Russia, with the Russians charging aggression in the League of Nations.) There was also a story about the horribly loud roaring and screaming noises in the sky around Butch O'Hare Field (the Army Air Force denied any knowledge of what caused them), and all in all we were nearly into the Loop before I got to page 7 and the headline that said,

FORMER MOVIE STAR ARRESTED ON  
CHARGES OF SLANDERING U.S. & F.B.I.

So old Ron was in the slammer.

Not only was old Ron in the slammer, but when I read the story more carefully the things he was accused of having said—the F.B.I. were "fascists"; it was a citizen's duty to "resist" them—were things he had said while I was sitting right there.

There had only been four people at

that table. I didn't suppose Ron had turned himself in, nor that his wife had done it; I knew I hadn't.

My mystery pal Larry Douglas had put the finger on him.

He had deliberately dragged me down there—no, even before that. He had sought me out and got me indebted to him. Then he had taken me down there for the specific purpose of getting old Ron Reagan in trouble. Why? I couldn't guess. I didn't care. The one thing I was sure of was that Larry Douglas was bad news.

I really began to worry about that; but by then it was a little too late.

The Twentieth Century Limited was due in at six P.M. exactly. I had left myself plenty of time to get there. But I was almost late, because as I was coming along Randolph sirens screamed up behind me and stopped, six cars blocking the street just ahead of my car. My heart was suddenly in my mouth.

It wasn't me they were after. It wasn't anyone they were after. They were just doing their duty to the rich and famous, convoying a limousine that was a football field long and with hubcaps of silver. Arab, of course. *Big Arab*. I thought for a moment it might be old Mekhtab ibn Bawzi himself, though he hardly ever came out in public any more. No, not quite, but it was his first-born son, Faisal ibn Mekhtab. Faisal wasn't ever hard to recognize, because you never saw him in public without the egg-sized ruby he wore around his neck and the six hard-nosed bodyguards who never took their eyes off it. Not even the city cops got between the bodyguards and Faisal. What the cops were

there to do was to hold us gape-eyed civilians back while Faisal, in white robes and tarboosh, minced across a scarlet carpet to enter a big new A & P supersuq. He was officially opening it. That made sense; he owned the whole chain, after all. The radio reporters, eyes respectfully averted, put a microphone in front of the august lips; camera bulbs flashed; a truckload of musicians struck up a medley of happy songs and, with golden shears, Faisal clipped the scarlet ribbon in the doorway.

It was interesting, kind of, but it took a good twenty minutes before he minced back into his Cadillac and the whole procession evaporated as rapidly as it had formed. So I found a place to park, and got into the station about five minutes of the hour, with my mind all full of rich Arabs and nasty F.B.I. women and treacherous Larry Douglasses, and hardly at all of my lady-love Greta. I didn't always meet her at the station when she came back from the New York run, but I tried to when possible. Especially on a Sunday, like today, when the weather was nice, and the two of us might take a walk down along the lake shore, or go to the Zoo. Of course, a stewardess worked for a living, and if she'd been up all night with cranky passengers or train-sick kids, then we'd just jump on the interurban and I'd take her home. . . .

How peaceful those bygone days seemed! I'd had everything I ever wanted, and hadn't known it.

In the big train room the dispatchers were busy posting arrival and departure times. It's kind of exciting being in Union Station, because from there you can go almost anywhere in the world—

anywhere in America, anyway. There were trains coming in from Los Angeles and Salt Lake City and New Orleans and Washington, DC, and departures for Boston and Minneapolis and Detroit and Houston; there were grinning red-caps wheeling bags with fussy passengers trotting worriedly beside them, and honeymoon couples being kissed good-bye by their families, and vacationers dragging themselves across the terrazzo floor with suitcases full of sandy seashells and straw hats and damp bathing suits. Apart from an occasional trip with Greta, and business now and then to Pittsburgh or Milwaukee, I didn't travel much. Maybe that's why Union Station always seemed so exotic to me. And so—I don't know— *competent*. You can set your watch by the trains; they take off on the click of the minute, come in just as the clock hand jumps to the dot.

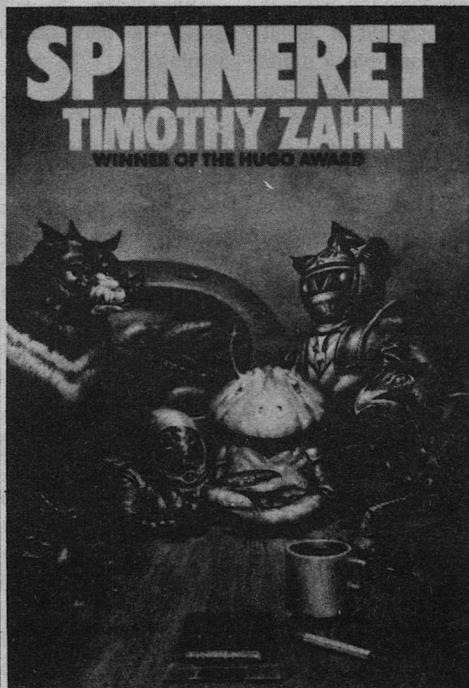
For which reason I was astonished to see that up on the train board, next to *Twentieth Century Limited*, a dispatcher was putting up the word *Delayed*.

I hurried to the crew lounge to see if I could find out why, half hoping that the dispatcher had made a mistake and Greta would be there waiting for me. She wasn't. No one seemed to know why, either. I caught up with another stew just as she was coming out of the women's locker room—she'd worked with Greta a time or two, but had switched to the prestigious Los Angeles Superchief run as soon as she'd accumulated enough seniority. She gave me a look of astonishment. "The Twentieth Century late? No, Nicky, that can't be; it's never late."

And she went off to make a phone

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call and came back looking worried. "Funny," she said. "They stopped it in the yards. Put on a new engineer."

"That doesn't sound good," I said, throat suddenly dry—had something gone wrong? An accident? An engineer who had a heart attack, or went crazy, or—there was no limit to the catastrophes my mind could invent.

But I didn't invent the right one.

I sat there for twenty minutes, waiting for something to happen, and when it did happen it was not good at all. It came in stages. Stage one was a trainman, hurrying in, looking scared. "You won't believe this," he called to a buddy as he entered. "They stopped the train in the yards. Took off the stewardesses, the conductor, the porters, the two other trainmen, the engineer, the fireman—only reason they didn't take me, I guess, is that I'm just pulling a relief shift, it's not my regular run. Clean sweep! Said something about conspiracy. . . ."

Stage two was when I recovered from all that enough to hear someone ask who "they" were . . . and heard the answer, by then not unexpected at all: "F.B.I."

And stage three was when I started to go out of the lounge and two neat young men fell into step beside me, one on each side, efficiently grasping my arms.

Nyla Christophe was standing at the *Official Use Only* door they took me through, her hands locked behind her, looking satisfied. She had every reason for that.

Silly me.

I had failed to see how simple this problem was from the point of view of

Chief Agent Nyla Christophe. Eye-witnesses that gave me an inconvenient alibi? No problem. Just arrest the witnesses. A witness in an F.B.I. jail, for all intents and purposes, no longer existed as a witness at all. So there was a nice, simple case to be made on the basis of photographs and fingerprints, and no need to worry about confusing details. No problem at all—for Nyla Christophe.

But for me, oh, yes! Lots of problems! And the worst of them just beginning.

The pilot of a Transcontinental & Western Airline luxury liner, coming into Chicago from the south, called Meigs Field to announce his approach. Clouds veiled the city, but he wasn't worried. Chicago didn't have any of those hundred-story buildings like New York; it had something to do with the fact that the city was built on alluvial soil, no bedrock anywhere near, so it wasn't easy to put up skyscrapers. It made things a little easier for pilots of the big tri-motors . . . except that this time, as he looked up, he suddenly saw a huge tower where none should have been. He turned desperately to miss it. When he looked back, it was gone, and all thirty-eight of the rich and adventurous passengers behind him, who chose to take the plane in seven hours instead of the train in fifteen, were cursing his name.

August 21 1983

7:20 P.M. Senator Dominic DeSota

I had drowsed off on the couch, waiting for Nyla to show up from the airport. When she did get to the hotel I guess

she just decided to let me sleep. I might have expected it. She always liked to get right into a quick practice session as soon as she checked in, even before she unpacked, even before she used the bathroom sometimes; "How do you get to Carnegie Hall?" she asks, and then gives the answer, "Practice, practice, practice! And when I put it off it just gets that much harder to do, Dom, dear." So what woke me was the sound of the Guarnerius from the next room—one of the unaccompanied Bach chaconnes. I recognized it pretty easily. I wouldn't have, even a year or so earlier, because classical music was one of the many things that a career in politics hadn't left time for, but having a love affair with Nyla Christophe had been educational in a lot of ways. That was only one of them.

I got up and walked into the bedroom. There she was, standing before the fireplace with her back to me, sawing away on the old fiddle with her body swaying in time. I walked up behind her and reached up under her raised arm to cup her right breast. She didn't miss a beat. Eyes closed, bow bouncing over the strings, she said, "Give me two more minutes, honey."

"And what am I supposed to do for those two minutes?" I asked her.

She sang it over her shoulder to the bars of the music:

"Order up some champagne—

"Or turn down the bedclothes—

"Or you could just start getting naked."

I kissed the back of her neck. "I'll try number three," I said. I didn't really start to undress. One of the other things I'd learned from Nyla was that it was

more fun when we did it together. I went back into the living room—no, I guess you'd call it something classier than that, the salon, maybe—I knew she wouldn't be two minutes. More like a quarter of an hour. When she's on tour Nyla's always afraid she's going to forget something important—how to finger a passage, or the best way to break a three- or four-note chord. So when she practices she does it all, and it takes time. I sat back down on the huge couch and picked up the phone.

While I was dialing my office number I gazed around. I was glad I didn't have to try to put this hotel bill on my expense account. The taxpayers would never have stood for it. Neither would the IRS, if any normal human being had tried to claim that a four-room suite was a necessary business expense. But that's one of the beauty parts of being a concert violinist. Nyla always claims she needs the extra space to practice before her concerts. As a matter of fact, she more or less does. As a matter of strategy, she never gets asked that question by an IRS auditor, because her hotel suites are always engaged and paid for by the management of the concert hall where she is playing; the bill never appears on her cash flow at all.

When my office answered I asked for Jock McClenny. He recognized my voice, of course, so I just said, "I'm at the usual place, Jock. Anything urgent going on?"

"Not a thing, Senator. I'll give you a shout if anything comes up."

"Fine," I said, getting ready to hang up. I knew he'd call if necessary, and also knew that the chance was very small that anything would come up im-

portant enough for Jock to call me at Nyla's hotel. He cleared his throat in a way that stopped me. "What, Jock?" I asked.

"Just that I had this call from the Pentagon, Senator. It's peculiar. Routine call from Sandia, just checking to make sure you were there."

Sandia was a research facility in New Mexico. I sat up straighter. "Well, I'm not."

"Exactly, Senator," he said, and I could almost see him nodding earnestly, pleased that I'd got the point. And pleased, too, that the military had somehow screwed things up again, because Jock always enjoys catching the Pentagon in some kind of goof.

As a matter of fact, I enjoyed that, too. I would have been pleased to explore that one a little further, but the sound of fiddling in the next room had stopped.

"Keep on top if it, Jock," I ordered. "Talk to you later."

"Right, Senator," he said—a little enviously, I thought. I didn't blame him. Nyla's a spectacularly good-looking woman, which would account for a certain amount of envy from anyone, but it also happens that Jock is a music buff. He never missed one of Nyla's performances. Sometimes, when I was in the box she'd put aside for me, I'd look down and see him along about the twentieth row, gazing at her with that look of patient adoration.

When I opened the door to the bedroom I wondered what kind of gaze he would have given her as I saw her now—shimmying her hips to slide the dress down over them, bare on top, the Guarnerius safely back in its case. She

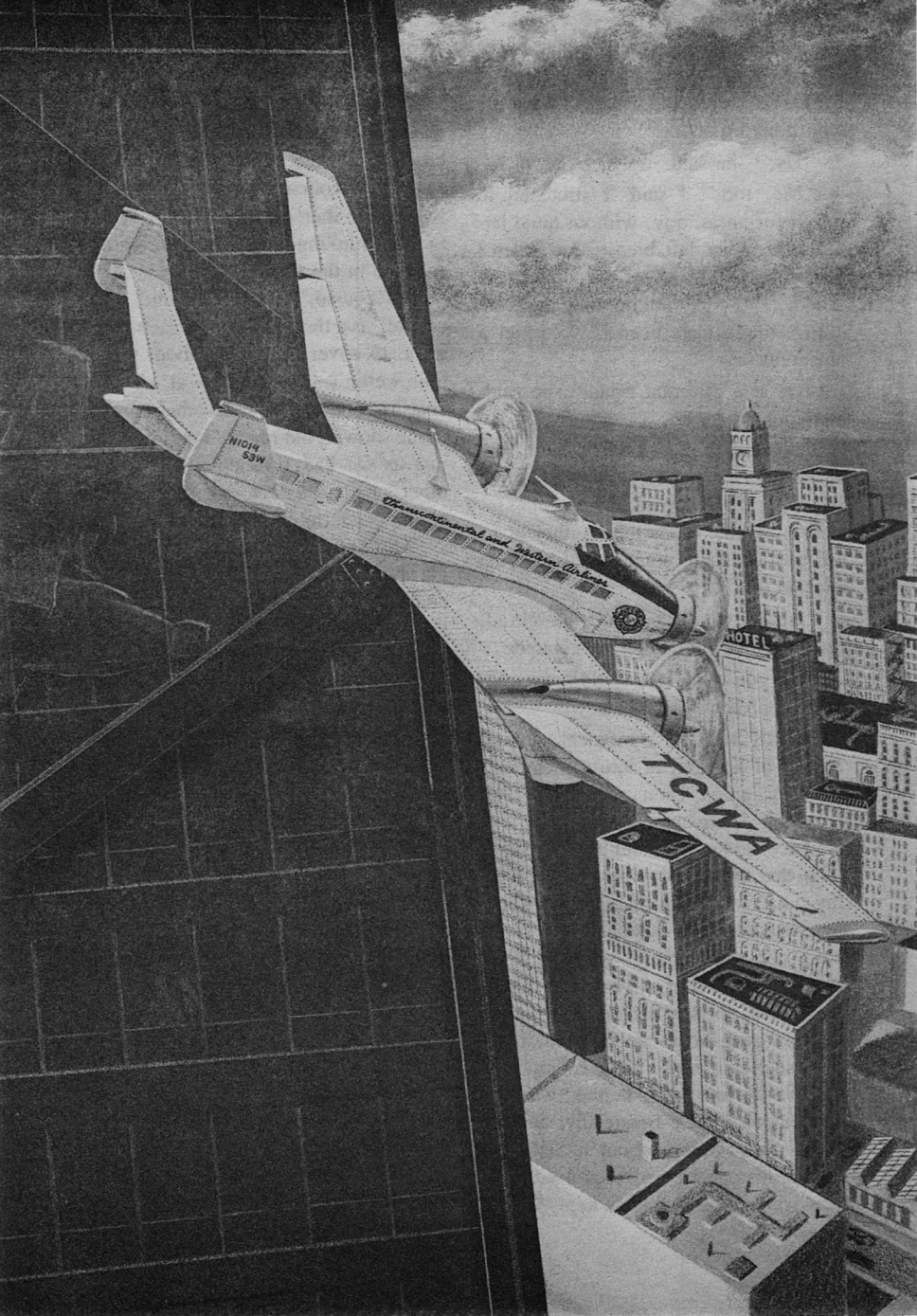
gave me a haughty look. "You've still got your clothes on," she accused.

"That's easily remedied," I said, and proved it to her with no trouble at all.

In the normal course of events there was just no way that a married man like me could be having an affair with a married woman like Nyla Christophe. Our worlds just didn't intersect. I was a failed physicist who'd gone into law and then politics. Nyla was something special. She'd grown up wild and crazy—she said so herself—and if it hadn't been for the luck of the Juilliard School scholarship auditions she probably would have wound up in jail. Or some worse place.

Instead she wound up as *the N\*Y\*L\*A C\*H\*R\*I\*S\*T\*O\*P\*H\*E B\*O\*W\*Q\*U\*I\*S\*T*, with a duplex on Lake Shore Drive—and a husband in investment banking—while I've got a condo on Marine—and a wife who's into ambition. If my wife, Marilyn, had her way, I'd wind up President. If I had my own way maybe I'd still wind up President, but I'd have a different First Lady. The funny thing is that Marilyn got us together in the first place. Didn't mean to, of course, but she was the one who thought it would be really good for my image if I let them put me on the Chicagoland Arts Council. That's where I met Nyla. We sat next to each other at a fund-raising dinner on a Wednesday, appeared together on Terkel's radio show on a Friday morning and were in bed together Friday night. Chemistry? That's the word they use, but whatever it was it worked between us.

When we were spent and lying back against the heaped pillows, smoking that



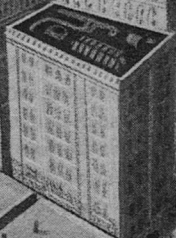
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after-lovemaking cigarette that tastes the best of all, I took note of the faraway look in her eyes and asked, "What are you thinking about?"

"Us," she said.

"Me, too," I said. I stretched to reach for an ashtray, without quite letting go of her left breast, and when I had juggled it to where we could use it I added, "I was thinking how different things might have been if we'd met a different way."

"Or at a different time," she said, nodding.

I nodded back. "Like if we'd met before you married Henry—or I married Marilyn. If the two of us had come together by chance, without either of us being married to someone else. What do you think?"

"About what, Dom?" she asked, stubbing out the last of her cigarette.

"Do you think we would have married each other?" I asked.

She lay back for a moment, poking the tip of her tongue into my ear in a friendly way. Then she said, "Of course." There wasn't really any "of course" about it, though. We didn't have that much in common, not counting what we had in bed. I don't know much about music—country and Western's about as far as I go—and Nyla actively hated most of what I did in politics. And, for that matter, if we were all that gung-ho to be married, there were such things as divorce courts. Neither of us had kids; neither was dependent on a mate financially; and the voters don't worry about a Senator's marital history the way they used to. If remarriage after a divorce kept you out

of office, Reagan would not be President now.

No, what kept us from being married was only that neither of us wanted to take the chance. That was why Nyla said, "Of course," again, very positively, and then sat up. "Now I've got to start thinking about getting dressed. Join me in the shower?"

"Of course," I said, and did. "Of course" is a thing we said to each other a lot, to cover up doubts about things that weren't "of course" at all. We splashed and soaped each other happily in the shower; but not for long, because just as we had finished soaping each other's parts satisfactorily, the bathside phone began to chirp at us.

"Oh, hell," said Nyla. "No, let me get it, Dom." There was another "of course." Of course I let her get it, since it might easily have been from someone who should not know I was answering her phone—manager, husband, reporter, fiddle fan who'd somehow managed to get the number of her suite—lover's wife, even—but we both knew it was not likely to be any of the above. It wasn't. It was who I suspected it would be, because who else would still be in the office on a Sunday evening? Nyla handed it to me, making a face; she didn't much like Jock. Or at least didn't like the fact that he knew about us. She had left the phone soapy with her soapy hands, and my own soapiness nearly made me drop it. But I managed to say, "Yes, Jock?"

Then I did in fact drop it, or barely caught it by the cord as it was heading for the bottom of the shower stall. "It's about that query from Sandia," he said. "It's from the Cathouse, Senator."



That's when I had the trouble with the phone, because the Cathouse was not usually something we talked about on an unsecured phone. "Yes?" I snapped.

"They've called back, Senator. They say they've checked fingerprints, voiceprint, I.D. picture—everything's a match. They've got this man in custody, and he says he's you. And, Senator, so do they."

A recent widow, sleeping badly in the unaccustomed emptiness of the king-sized bed, half heard and half dreamed a sound of screaming. When she was fully awake it didn't go away. Puzzled, she went to the window. There was nothing there but the quiet lawns of her condo village. She opened the windows—not easily; people in hundred and fifty thousand dollar condos seldom sought outside air—and the screams were instantly louder, with smells of rotting garbage. Was someone being raped? Murdered? But neither of those was conceivable to her, in the quiet elegance of Cabrini Gardens.

August 22 1983

2:50 A.M. Senator Dominic DeSota

There weren't that many flights from Washington to Albuquerque on a Sunday night, and none of them was non-stop. For a while I thought I'd have to call up the Air Force and get help from them. Jock finally managed to get me on TWA, leaving National at nine o'clock. It was four hours travel time and two time zones, and luckily I was able to sleep a little between Kansas City and Albuquerque. That was the end of civilian comfort. After that it was

military all the way. It didn't seem as though any of the War Department people ever slept. They picked me up outside the sleepy terminal in a staff car and raced through the deserted highways and freeways to the entrance to the Sandia base. My driver was a WAC MP lieutenant. The guards saluted her on sight. They demanded no I.D., but as we pulled away from the guard post an MP personnel carrier started up behind us. It followed us all the way across the base, past the solar power installation, past the nuclear area, to Building A-440.

I had been in Building A-440 before. It was what we called the Cathouse. The King of the Cats was a Regular Army colonel named Martineau. We'd been fairly friendly, at one set of hearings or another, and I was a little surprised he hadn't phoned me himself. It would have been a reasonably casual and informal thing to do.

As I got out, three MPs got out of the personnel carrier and followed me in. I began to perceive that there was nothing casual or informal about this visit. The MPs did not march in step, and they made no attempt to surround me, much less to touch me. But they never took their eyes off me, all the way in the door and through the halls to the office of Colonel Jacob Martineau. "Colonel," I said, nodding to him.

He nodded back. "Senator," he acknowledged, and then, "May I see your papers, please?"

No, not in the least informal. Martineau went over my Illinois driver's license, my senatorial courtesy pass, and the red-tagged plastic with my fingerprints and magnetic coding on it that

the War Department gives to certain nuisances like myself, who have no military rank but do have the right, sometimes, to visit classified military installations.

He didn't stop with reading the spots off each and every one of them. He put the WD card in one of those little desktop terminals they use in fancy restaurants when you want to put a two-hundred-dollar dinner check on your American Express card, and when that had checked out he still wasn't satisfied. "Senator," he said, "I'd like you to tell me where we met last. Was it at the Pentagon or here?"

I said levelly, "As you well know, Jacob, it wasn't either one. It was in Boca Raton, at the conference on speculative technology. We were both observers."

He grinned. Relaxing slightly, he pushed my wallet back to me. "You're you, I guess, Dom," he said. "The other fellow didn't remember Boca Raton."

I started to ask a question about this "other fellow," but the colonel was ahead of me. "Hold on a second, please. Sergeant! Have the prisoner brought up to the interview room, please. The Senator and I will talk to him now."

He watched the sergeant leave the room before he said, "We've got troubles here, Dominic."

"Because of this fellow who says he's me?"

"He doesn't exactly say that," frowned the colonel. "The trouble is, he doesn't say much of anything. At first we thought he was you. Now—"

"Now you don't any more?"

The colonel hesitated. "Now," he

said, "I hate to tell you what I do think, but there isn't any other good way to explain it. Senator, I think this other man is a Cat."

*And elsewhere in the news—*

A farmer named Wayne Sochsteiffer woke up to the sound of the early news report on radio station WGN, yawned, stretched, plodded over to the window, wondering whether he would have to put water on the beans in the north forty. When he got to the window he yelped in surprise. The north forty wasn't there. What was there was a chainlink fence, a parking lot that looked as though it would hold a thousand cars, and a long, low building that bore the sign: "Nissan Motors—Your Best in Quality."

This Wayne Sochsteiffer was mightily surprised.

This Wayne Sochsteiffer was not nearly so surprised as a farmer named Wayne Sochsteiffer who woke up in the same way, looked out the same window and saw only what he expected to see: his north forty, olive green in the early morning light. His farm was there. His surprise came when he turned back to the double bed and saw, peering out at him sleepily from her side of the covers, a quite different wife.

August 22 1983

4:20 A.M. Senator Dominic DeSota

The Căthouse personnel didn't seem to notice that it was the middle of the night. The prisoner had, though. He had been sound asleep. The sergeant phoned from the detention section to say that the prisoner begged permission to void his bladder and take a shower before he came up to be interviewed. "Why not?"

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A BANTAM **SPECTRA** BOOK



I said, when Colonel Martineau asked me. "I don't mind being a little considerate. Especially to me."

He opened his lips and laughed silently. It was the kind of laugh you give an incongruity, not a joke. He gave the permission and ordered up coffee, as much for ourselves as for the prisoner, and then we sat looking at each other while we waited.

There didn't seem to be much to say.

We could have chatted about this person who seemed to be me, but both of us had formed the habit of not chatting about Cats. In fact, we never even used the term except in the confines of a classified meeting. As far as I knew, the term had never appeared in writing anywhere. It was the biggest secret in America's most secret defense research facility. It was such a big secret that I hadn't for one minute believed it was true.

Sandia wasn't all secret. There was the solar power research facility, and that wasn't secret at all; it took up more than half the thousands of sprawling acres of the base. The nuclear weapons section wasn't exactly a secret, either—only what was going on in it was secret. The world knew that there was a flow of smart bombs and self-piloting missiles coming out of that part. After that no one knew. Or at least, no one was supposed to know that there were parts of Sandia a lot weirder than any of that. There was one small section devoted to climate modification as a way of cutting off an enemy's agriculture, and another exploring the possibility of genetic warfare. Genetic. The goodies they were whipping up weren't viruses or chemicals to attack the pres-

ent population of a foe state. They were DNA-spoilers. They were meant to make the enemy's children grow up incompetent and defeatable.

I defended myself by saying that, although this seemed immoral to me, it also seemed as though it wouldn't ever work anyway.

Then there was Psi-War. Even doubtfuller, even more peculiar. Inside the Psi-War building we kept a herd that averaged eighteen or twenty wackos and loopies—as young as eight years old, as old as eighty—all very odd indeed. Each one of them claimed some special ability. There were the guys with the "out-of-body" skills; they said they could leave their own bodies and enter another's, even another's thousands of miles away, and see with the other person's eyes and hear with the other person's ears. Wonderful! They could go to an enemy base and sniff out every secret there was! Some of them said they had actually done that, although we had yet to find a secret that could be made to work for us, or that any other evidence suggested was working for anyone else.

Of this whole shebang I was a big, big skeptic. Part of the reason was simple cynicism. The loopies were *so* loopy, and besides they had a nasty little habit of cheating on the tests. Once caught cheating they were on probation; twice caught, they were out. Sooner or later, they were all out. This didn't deter the people who ran Psi-War very much, though. As soon as they decided one weirdo was a fake and sent him on his way, the talent scouts turned up another in some tanktown in Idaho or Alabama

and shot him over to us to be checked out . . . and so on, and on.

The other reason I was a skeptic was not cynical at all. On the contrary. It was the opposite of cynicism; my fellow committee members charged me with almost idealism when I hinted at it.

I didn't believe we really *had* any enemies.

Oh, the Japanese and the Germans, sure, they were really tough competitors and our business community hated them as much as old Cato had hated Carthage. They really lambasted us in international trade; but did we want to go to war with them? By "enemies" I mean irreconcilable blood-foes, like Adolf Hitler or Josef Stalin had been a while back. They were long gone—in fact, there was a grandson of Stalin's in the Russian diplomatic corps that I played poker with when I got a chance. Nice guy. Such mortal, military enemies simply did not exist. That wasn't so much wisdom and tolerance on our part as it was luck, of course—if the Cold War had got a few degrees hotter some years back it could have been pretty bad. But we were saved all of that when the Russians and the Chinese escalated their border arguments into a full-scale nuclear confrontation. They stopped after a few bombs, but neither of them was a really worrisome military enemy any more. Their big problem was trying to keep from falling apart entirely.

For all of those reasons, it might seem puzzling that our Joint Committee on Weapons Research Analysis had never tried to cut off funds for even Psi-War. There were reasons for that. The big reason was that these projects were so cheap they didn't matter. Given that it

was U.S. national policy to maintain a strong defense—and with President Reagan in the White House there was no doubt about that policy—there had to be something like Sandia. If Psi-War and genetics and the Cathouse were all a total waste of money, as I rather thought they were, the amounts involved were so pitifully tiny that they simply weren't worth the trouble of defunding. Psi-War and the Cathouse together cost less per year than the upkeep on a single missile silo.

And if any of them should actually turn out to make a workable weapons system. . . .

Well, the potential was simply enormous. Especially the Cathouse.

The Cathouse was named after something called "Schroedinger's Cat." What was Schroedinger's Cat? Well, said the physicist who was testifying before us the first time this came up, Schroedinger was a man who had discovered something called "quantum mechanics." Ah, yes, and what was quantum mechanics? Well, said the physicist, basically it was a new way of looking at physics. When that explanation didn't seem quite to satisfy any of us hard-bitten politicians on the Joint Committee he tried again. Quantum mechanics, he said, got its name from Schroedinger's discovery that energy, for instance, didn't come in a sort of uniform endless flow, like water out of a tap (although, he corrected himself, even water out of a tap only *looks* uniform and endless, it being in fact made up of molecules and atoms and even smaller particles)—didn't come in an endless flow, that was, but in unitary packets called "quanta." The basic quantum of light

was the photon. Well, we began to feel we might be getting to solid ground there, because even senators and congressmen had heard of photons. But then he dashed our hopes by getting back to the cat. What did the cat have to do with all this? Well, said the physicist, gamely hanging in there in the face of our expressions, that was a kind of a mind-experiment Schroedinger proposed. You see, there is this other thing called the Heisenberg uncertainty principle. And what was the Heisenberg uncertainty principle when it was home? Well, he said, shifting uncomfortably in the witness chair, that was a little hard to explain. . . .

He was wrong about that. It wasn't hard to explain at all. It was just hard to understand. According to Heisenberg, you could never know both the *position* and the *movement* of a particle. Either you could know where it was, or you could know where it was going. You couldn't know both.

Worse than that, there were some questions that you not only couldn't find out an answer to, but there *wasn't* an answer, and that's when we got to the cat. Suppose you put a cat in a box, said Schroedinger. Suppose you put in with the cat a radioactive particle, which has exactly one chance in two of fissioning. Suppose in with the cat and the radio-nuclide, you put a can of poison gas with a switch that will be triggered if the particle fissions. Then you look at the outside of the box and ask yourself if the cat is alive or dead. If the particle has fissioned, it's dead. If the particle hasn't fissioned, the gas was not released and the cat is alive.

But from outside there is no knowing

which is true. From outside, there is a .5 chance that the cat's alive.

But a cat can't be .5 alive.

So, said the physicist triumphantly, beaming around us in pleasure at having made it so clear, the point is that *both* things are true. The cat's alive. The cat's dead. But each statement is true in a particular universe. At the point of decision the universes split—and now, forever after, there will be parallel universes. A cat-alive universe, and a cat-dead universe. A different universe every time a subnuclear reaction takes place that could go either way—for it goes *both* ways, and universes are multiplied endlessly.

Senator Kennedy cleared his throat at that point. "Ah, Dr. Fass," he said. "that is most interesting, as an exercise in speculation. But in the real universe we open the box and see if the cat's dead."

"No, no, Senator!" cried the physicist. "No, that's wholly wrong. They're all real."

We looked at each other. "In a mathematical sense, you mean?" Kennedy tried.

"In *every* sense," cried Fass, wagging his head violently. "Those parallel universes, created at the rate of millions every microsecond, are just as 'real' as the one I'm testifying before you in. Or, to put it in a different context, the universe we inhabit is exactly as 'imaginary' as any of them."

So we sat there like dummies, eighteen of us, congressmen and senators from all over the United States, wondering if this man was trying to put us on—wondering what it all meant if he wasn't. A congressman from New Jer-

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sey leaned over to whisper in my ear: "Do you see any military application in this, Dom?"

"Ask him, Jim," I whispered back, and when the Congressman did, the physicist looked astonished.

"Oh, I do beg your pardon, gentlemen," he said—"and ladies, too, I mean," he added, toward Senator Byrne. "I thought all that had been made clear. Well. Suppose you want to H-bomb a city, or a military installation, or anything at all, anywhere in the world. You build your bomb. You take it into one of the parallel universes. You fly it to the latitude and longitude of Tokyo—I mean, of whatever the place is—and you push it back into our world and detonate it. *Boom*. Whatever it is, it's gone. If you have ten thousand targets—say, the entire missile capacity of another country—you just build ten thousand bombs and push them all through at once. It can't be defended against. The other people can't see it coming. Because, in their world, it *isn't* coming . . . until it's there."

And sat back, looking pleased with himself.

And we all sat back, too. We looked at each other. But I do not think any of us really were looking pleased.

Even that might not have sold the committee, except for the one big fact. I've mentioned it already: If this program didn't work, as all of us thought and most of us hoped it wouldn't, very little would be lost. For it, like Psi-War, was very, very cheap.

Well, they finally brought this guy in, and I have to say it was one of the most unpleasant experiences of my life.

Not painful. Not intolerable. But non-pleasant, wholly without pleasure in any way.

Like most men, I really dislike shopping. Especially for clothes; and one of the principle reasons for that is that I detest those three-way mirrors they have in clothing stores. They are simply unfair. They catch you by surprise. You try on a suit; the salesperson tells you lyingly that it fits as though custom-tailored; he walks you down the store to where three mirrors are linked together, like a medieval triptych. You look into them all unaware, and the first thing you know you're staring at your own profile. I never voluntarily look at my profile. I consider the idea almost obscene. It is not the way God intended me to see myself, and the proof of that is that when I do see myself that way I look perfectly terrible. I don't even recognize that simpering fellow with the funny-shaped nose and the stick-out chin. How he got into the mirror that should have been reflecting me is always a great mystery . . . and yet I am not wholly lost to reality. I know that person is really me. I just don't *want* to know it.

That's how it was in the Cathouse at Sandia.

When they brought this person in he didn't look at me. He didn't look at anybody. They'd let him splash water on his face, at least, but then they'd handcuffed his arms behind his back. Maybe one reason he kept his eyes on the ground was fear of falling. I don't think so. I think there was only one reason, and that was that he knew if he raised them the eyes he would be looking into would be his own. Or *my* own. Ours.



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I hated it.

It was a thousand times worse than the three-way mirrors in the clothing stores. It was as bad as it could be.

This other I had my face, my hair color, even my little thinning patch on top. My everything. Almost everything, for there were small differences—he was maybe six or eight pounds lighter than I, and what he was wearing was no garment I had ever owned. It was a one-piece coverall made out of some shiny forest-green fabric, with pockets all over the chest, and where trouser pockets would have been if there had been separate trousers. There were even pockets on the sleeves and over the right thigh. Perhaps all those pockets once had held my other self's valued possessions. No more. They had been searched and rifled, no doubt by the colonel's troops.

I made myself say, "Dominic. Look at me."

Silence. The other Dominic didn't answer, didn't look up, didn't respond at all—though I could tell from the stubborn way he set his head that he had heard me clearly enough. No one else in the room spoke, either. The colonel watched closely but was silent; and while Colonel Martineau didn't speak none of his men was likely to.

I tried again. "Dominic! For God's sake tell me what's happening."

The other I kept his eyes on the floor for a while longer. Then he looked up, but not at me. He gazed over Martineau's head at the clock on the wall, making some sort of calculation. Then he turned to me and spoke. "Dominic," he said, "for God's sake, I can't."

It was not a satisfying answer. Colo-

nel Martineau opened his mouth to say something, but I waved it shut again. "Please," I said.

That other me said regretfully, "Well, Dom, old buddy, as a matter of fact the reason I'm here is that I wanted to tell you something. By 'you,'" he explained, "I don't mean second-person-plural or even single-other-person-than-myself. I mean you-Dominic-DeSota, who is, as you know, also me."

The colonel was looking suddenly furious. It took me a different way. "Oh, Dom," I said sorrowfully to myself, "how many times I've wished to myself that I'd outgrow playing that sort of game. Spit out what you wanted to tell me, why don't you?"

"Because it's too late, Dom," he said.

"Too late for goddam *what?*"

"The thing I was going to warn you about, you know?"

"I *don't* know!"

"But you will. It's happening. And the next time we meet—" he offered a grin, but it looked more as though he were crying—"it won't be me you are meeting." He stopped there, started to speak again, hesitated, glanced at the clock—

And then he disappeared.

When I say he "disappeared" that is the exact right word, but it may give the wrong image. The other Dominic DeSota didn't "disappear" by ducking out of sight into a closet or something. Nor did he turn transparent like an actor in a TV sci-fi show. He just *disappeared*. At one instant he was there. At the next he was not.

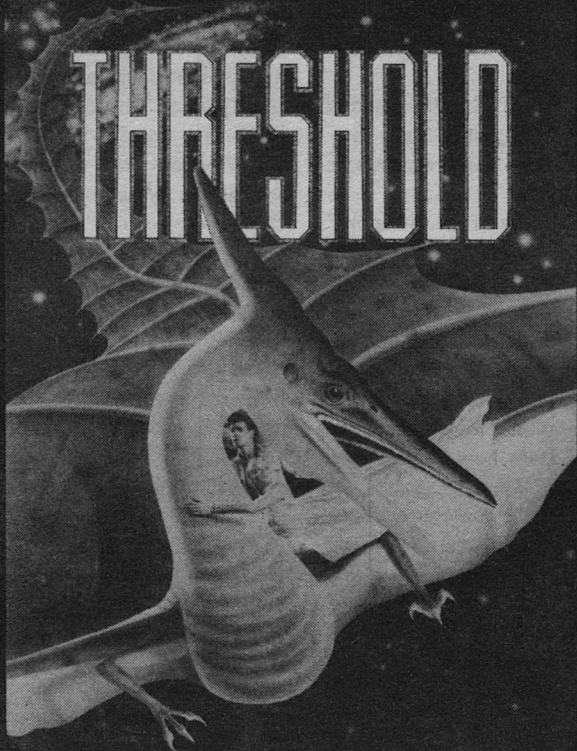
And a pair of handcuffs, locked

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A BANTAM **SPECTRA** BOOK

around no wrists at all, clattered to the floor where he had been.

Things like that simply do not happen in my life. I had no reactions preprogrammed for flagrant violations of natural law, and neither did Colonel Martineau. He looked at me. I looked at him.

Neither of us said a word about the disappearance, unless "Holy shit!" is a word. I *think* I heard that whisper from the colonel.

"Any idea what he was talking about, Colonel?" I asked—just to make sure. "No? I thought not. Well, what do we do now?"

"Beats the hell out of me, Senator," he said. But although a commanding officer of the Army is allowed to say that, he is not allowed to mean it. He called in a sergeant and issued orders for search parties to look for my missing other self; the sergeant looked bewildered and the colonel looked resigned, because we all knew how little use that was going to be. "Do it, Sergeant," he said, and watched the non-com start off. "Well," he said to me at last, "one good thing. He said whatever it was was happening already, so we're sure to find out before long what this is all about."

"I wish I were sure that was a good thing," I said. And, as a matter of fact, when it turned out to be true, ten minutes later, it also turned out not to be a good thing in any way at all. Out of the room we went and down the hall, the colonel's little detachment of troops following in handdog route step, wondering where they'd screwed the bird. And coming toward us was another detachment of troops, a dozen of them or so. They were in route step, too, but not

the least handdog. They were wearing combat fatigues instead of dress sun-tans, and they carried funny-looking, short-barreled carbines slung over their shoulders. The carbines didn't stay slung. "Hup," said a non-com when they were half a dozen yards away. The detachment stopped. The troopers sank to their knees. The carbines revolved off their straps and were aimed right at us.

An officer stepped forward from the middle of the detachment. "Holy shit," said Colonel Martineau again, and I didn't have to ask why.

The officer was wearing the same combat gear as the troops, but you could tell he was an officer because he carried a pistol instead of a carbine. There was something else I could tell about him right away, and he confirmed it when he spoke. "I'm Major Dominic DeSota of the United States Army," he said, in a voice I knew very well, "and you are all my prisoners of war."

He said it clearly enough, but there was a strain in his voice. I knew why. The words were addressed to the colonel, but the man's eyes were stuck on me, and the expression on his face was one I knew well. It was the same expression I wore myself. I said, "Hello, me." The other guy's expression hardened. "I thought you'd disappeared," I went on. "Was that some kind of a joke?"

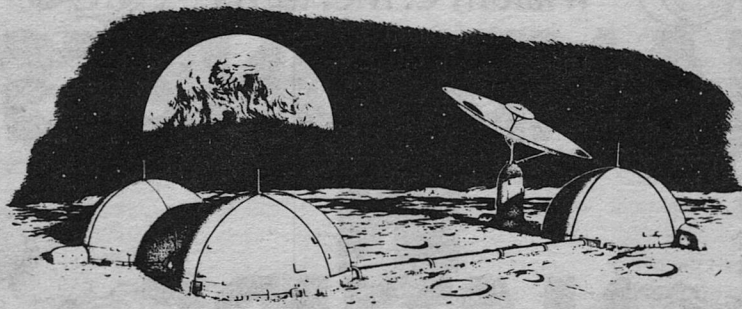
He jerked his head at a soldier, who stepped up behind me and grabbed my arms. Something cold and harsh bit into my wrists, behind my back, and I knew I'd been handcuffed. "I don't know what you mean about disappearing," the other me grated, "but there's no joke. You're all in protective custody."

“For what?” demanded the colonel, accepting handcuffs of his own.

“Just while we straighten things out with your government,” the “I” assured us. “We have to explain to them

what they’re going to do, and you’re prisoners until they agree. That’s your best option, see? If you don’t like it you do have one other choice. You can offer resistance. Then you won’t be prisoners any more, just dead.” ■

CONTINUED IN NEXT ISSUE



● A bit less than three years ago, Susan M. Shwartz had a story here called “Heritage of Flight,” which proved to be one of the most controversial (and popular) stories of the year. Its controversiality stemmed from the fact that it thrust its characters into a profoundly painful ethical dilemma—what do you do when your own survival seems completely incompatible with that of another intelligent species?—and didn’t allow them any easy outs. Having been through that, they couldn’t easily forget—and neither could Susan or many of her readers. Next month she returns with a later look at how the survivors deal with the aftereffects. Sometimes the best way to solve your own problems is to watch somebody else struggling with similar ones, no matter how oddly distorted the similarity. . . .

Our February issue will also offer another of Harry Turtledove’s “sim world” stories, which, as you may have already noticed, are gradually exploring the far-ranging ramifications of a single deviation from our own history. Plus, of course, Part 2 of Frederik Pohl’s *The Coming of the Quantum Cats*, Margaret L. Silbar’s latest venture into the oddities of modern physics, and a variety of short stories.

## IN TIMES TO COME



William C. McHarris

# HANDEDNESS IN NATURE

Right handed, left handed. It doesn't really matter. Or does it?

We are all familiar with a myriad of things in this world that come in right- or left-handed forms. Some of them are glaringly obvious: hands and feet themselves, right- or left-handed screws, and right- or left-handed twists on sea shells and twining plants. Others are considerably less obvious: the difference between the functions (and psychology) of the right and left halves of our brains or the right- versus left-handed effects of the spinning earth's Coriolis force (which, for example, tends to cause water to spiral counterclockwise down a drain in the Northern Hemisphere, clockwise in the Southern Hemisphere).

And many are just plain arbitrary: whether the hands of a clock move clockwise or counterclockwise (by convention designated right- and left-handed, respectively), whether we drive on the right or left side of the road, or which type of coordinate system we use (right-handed for most scientists but left-handed for mathematicians).

Most of us are painfully aware that we can make life unpleasant for ourselves by needlessly thwarting convention. It simply doesn't pay to drive on the wrong side of the road. Also, you can come down with an acute case of confusion if you try to decipher a vector equation using the wrong coordinate system. But, in a deeper sense, does it

really matter? Surely nature recognizes no *fundamental* difference between right- and left-handedness?

Just as we could have set up our conventions regarding roads and clocks in the opposite fashion, does it not follow that nature could easily have set up her conventions in reverse? A left-handed helix formed by a twining honeysuckle vine could be shifted in midcourse into a right-handed helix, even though it might require the intervention of an awkward animal brushing up against it. It might take a little more doing, but a counterclockwise sea snail could undoubtedly be coerced into continuing its growth in a clockwise spiral. And planets exist whose rotation is from east to west, resulting in Coriolis forces the reverse of those we experience on Earth. The consensus throughout most of history was that specific handedness was merely an accident of convention or of evolution—certainly nothing fundamental.

Another way of stating this is, "The basic laws of physics are invariant with respect to mirror reflections." Here we concern ourselves primarily with the laws of mechanics—position and motion—so what this means is that there should be no real difference between looking at a scene directly and looking at its reflection. For example, without outside clues such as rings, we cannot tell whether we are looking at a photograph of a right hand or a reversed photograph of a left hand. We could even watch a movie of a football game, and, without extraneous clues such as backward letters (which hopefully have nothing to do with the trajectories of

balls or players!), we would not know whether or not the film was facing forward or turned around in the projector. (Here it should be emphasized that we are talking about the film being simply turned around, not being run backward. The latter would imply "time reversal," which is quite a different thing from handedness.) In other words, Alice may have encountered some strange characters through the looking-glass, but, according to the basic laws of mechanics, they behaved no more strangely in looking-glass land than they would have done in our own world.

The first erosion of this comfortable, intuitive view of handedness began to take place in the 1800s, when chemists recognized that certain compounds existed in forms having opposite handedness. A major contribution was made in 1848 by Louis Pasteur, then still a student in Paris. He noticed that salts of tartaric acid (the principal organic acid in grapes and wine) crystallized in two forms, the crystals of which formed mirror images of each other. (He separated the two forms by tediously picking out the different tiny crystals with the aid of a microscope.)

A more severe erosion occurred in 1956, when Chen Ning Lee and Tsung Dao Yang, two Chinese-American physicists working at Columbia University and Brookhaven National Laboratory, suggested that the so-called weak interactions in nuclear and particle physics did not "conserve parity," i.e., weak interactions violate the mirror-image invariance we have been discussing.

These two seemingly unrelated ero-

sions of handedness invariance built up into scientific earthquakes, resulting in extensive shifts in the structure of scientific thought. Let us examine the non-conservation of parity by weak interactions first, and then we shall return to the handedness of molecules and see that there may be a possible connection between the two. Arcane concepts arising from high-energy physics may have a link to ideas of fundamental biological importance. Nature may well be far more unified than we realize!

To understand what parity non-conservation means, we first need to examine a more formal definition of parity itself. To do this we have to take a quick peek into the weird world of quantum mechanics, which describes the sub-microscopic worlds of molecules, atoms, nuclei, and elementary particles.

Light has a dual, two-faced nature, sometimes behaving like waves and sometimes like particles. For example, in being refracted through a prism and split into a rainbow, light behaves as if it were made up of waves; however, in the photoelectric effect (responsible for "electric eyes"), it acts as if it were made up of individual little particles, called "photons." Quantum mechanics tells us that matter behaves in a similar schizophrenic fashion, and in these sub-microscopic worlds it is the wave properties that dominate. Thus, we describe each little system by a "wave-function," in analogy to a description of a vibrating string. And each of these wave-functions must have a definite even (+) or odd (-) parity.

Consider a vibrating piano string,

say, middle-C. Its ends are fastened, so they cannot vibrate. The rest of the string can vibrate as a whole (with largest amplitude at its mid-point), sounding its fundamental or first-harmonic note, middle-C. The two halves of the string can also vibrate independently, with a non-vibrating "node" at the mid-point and the largest amplitudes at the one-fourth and three-fourths points. This mode of vibration sounds the second-harmonic note, C one octave above middle-C.

Next, let us imagine a mirror positioned exactly at the middle of the string. The fundamental mode looks the same on both sides of the mirror, so it is said to have *even* parity. (When we replace  $+x$  by  $-x$ , everything remains the same.) On the other hand, the only way for the two halves of the string to vibrate separately is for the front half to move up while the back half moves down, and vice versa. The two halves are negatives of each other, and this mode has *odd* parity. (In order for everything to remain the same when we replace  $+x$  with  $-x$ , we have to multiply the wave-function by  $-1$ .) The string can also vibrate in thirds, fourths, fifths, etc., as any musician knows, and these modes alternate even and odd parity. When there are an odd number of "half wavelengths"—the distance between non-vibrating nodes—we find even parity; when an even number of them, odd parity. You can verify by drawing pictures for yourself that the string can vibrate only in exactly even or exactly odd modes: If you try to concoct some other ("mixed") mode, you



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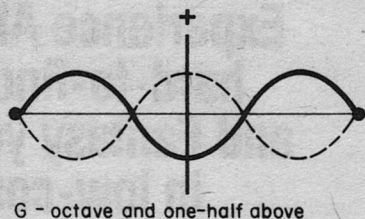
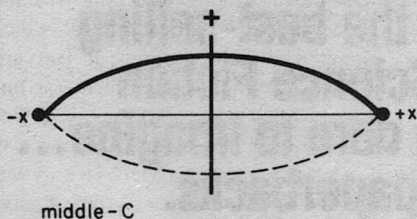
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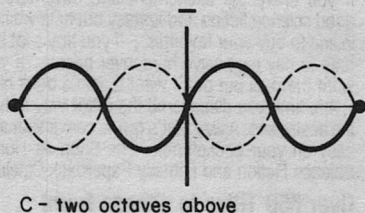
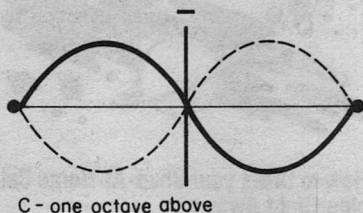
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## EVEN PARITY



## ODD PARITY



**Figure 2.** The first four harmonics of a vibrating middle-C piano string. If the string vibrates as a whole, it produces its fundamental or first harmonic, middle-C. If it vibrates in halves, it produces its second harmonic, the C one octave above middle-C. Vibrating in thirds and fourths, it produces the third and fourth harmonics. The harmonics alternate even and odd parity.

will have to start moving the fixed ends of the string, which changes the string into a different string and consequently a different problem from the one we are talking about.

In analogy with this picture of the string, all molecular, atomic, nuclear, and elementary-particle states have definite even or odd parity. However, and this is the crux of the matter, if our ideas of mirror symmetry are valid, there should be no preferred *direction* in these modes. For example, in the second-harmonic mode, motion with the front half of the string up first should have no

preference over motion with the back half of the string up first—they are equally probable. (If we were to find a preferred direction, this would be equivalent to mixing in some even parity into an odd-parity mode, or vice versa.) Or, to stretch the analogy a little taut: The sound should not preferentially emanate from either the front or the back of the string—it should come out equally intense from both directions. (Taught still: Except for difficulties of playing brought on by lack of familiarity, a piano having the bass at the right and the treble at the left should be equivalent

to a normal piano.)

Then along came Lee and Yang in 1956 to say that all of this is probably not true for weak interactions. (Of the four basic interactions in nature—strong, electromagnetic, weak, and gravitational—the weak one is responsible for nuclear beta-decay, the most common type of radioactivity. It's also the least intuitive of the lot.) They were led to this position by the peculiar decay properties of the  $K^+$  meson, and their conclusions were quickly confirmed by Chien Shiung Wu and her collaborators at Columbia University, who demonstrated that the beta-decay of cobalt-60 nuclei did indeed have a preferred direction. They aligned these nuclei, using extremely low temperatures to reduce interference from thermal vibrations, so that their spins pointed along the direction of a very strong magnetic field. The beta-particles were emitted preferentially in a direction *away* from the spins of the nuclei, rather than equally in the front and back directions. For this special (and esoteric!) case, the weak interaction, nature clearly does choose a preferred direction or handedness.

What, you may ask, does all of this have to do with the everyday world? The answer would probably be "very little," were it not for the discovery in recent years of a completely new type of weak interaction, the *neutral* weak interactions.

It has been the dream of physicists since before Einstein to unify our description of nature—some day to be able to describe all of the fundamental forces as merely different aspects of a single

"really fundamental" force. An important move in this direction was the "electroweak" unification, for which Stephen Weinberg (then at Harvard University) and Abdus Salam (at Imperial College, London) shared the Nobel Prize (with Sheldon Glashow, also at Harvard) in 1979. Much of this was worked out by means of group theory, which is a mathematical method for playing around with and exploiting the underlying symmetries of a problem. (It is somewhat like fitting tiles into a pattern and deducing the shapes of missing tiles from the holes that are left.)

To unify the electromagnetic and weak interactions via group theory means to combine their descriptive groups into a larger group. But there was a problem. The symmetries for this procedure required that the weak interaction have *three* components. The known weak interaction had only *two* components, positive (responsible, for example, for  $\beta^+$  decay, which converts a nuclear proton into a neutron) and negative ( $\beta^-$  decay, neutron into a proton). Might there perhaps be an unknown third type—neutral?

Indeed there is. The neutral weak interaction was first observed in 1973 in far-out neutrino-scattering experiments in high-energy physics. And this past year's Nobel Prize went to Carlo Rubbia and Simon van der Meer for their parts in the massive searches at CERN (the European Nuclear Research Center just outside Geneva) that first produced the  $W^+$ ,  $W^-$ , and  $Z^0$  "intermediate vector bosons," the particles mediating the *three* forms of the weak interaction. (Rubbia organized and directed one of

the large experimental groups, and van der Meer developed techniques that allowed antiprotons to be accelerated in sufficient quantities to achieve "reasonable" counting rates when they collided with proton beams. These enormous experiments required the collaboration of many people: The initial paper reporting their results in the journal, *Physics Letters*, had 135 authors, which gives you some idea of their sheer magnitude.)

This neutral weak interaction, with its  $Z^0$  boson. What of it? Being a "weak" interaction, it is parity non-conserving (although it also has a parity-conserving component, just to complicate the issue). In addition, being neutral, it can compete—and *interfere*—with the electromagnetic interaction. The electromagnetic interaction is responsible for holding atoms and molecules together, making it the ultimate "cause" of all chemistry and biology. Can this interference between the neutral-weak and electromagnetic forces introduce parity non-conservation (a preferred handedness) into chemistry?

The answer most likely is yes. During the last few years experimental groups around the world have observed definite parity non-conservation effects in *atomic* states. These effects are only of the order of one part in 100,000 or less, but there is little doubt that they are real.

Let us now return to Pasteur and molecules. What causes this molecular asymmetry, which is called "stereoisomerism" or "optical isomerism" (because the mirror images rotate polarized light in opposite directions)?

The cases of interest originate with the carbon atom. A saturated (fully bonded) carbon atom has four bonds, separated as far apart in space as possible, which causes them to point toward the vertices of a tetrahedron. Thus, a simple molecule like methane ( $\text{CH}_4$ ) has its carbon atom in the center and the four hydrogen atoms aligned toward the vertices of the tetrahedron. In a more complex structure such as a diamond, each carbon is tetrahedrally bonded to four carbon atoms, each of which is tetrahedrally bonded to another three carbon atoms (to make four bonds total), almost ad infinitum, making a diamond crystal one single giant "molecule."

What happens, now, if each of the four tetrahedral bonds on a carbon atom is bonded to something different? The result is *two* possible non-equivalent structures, which are mirror images that cannot be superimposed. (Organic chemists, who are every bit as adept as physicists at coining gold-plated words, call them "enantiomers.") Because in such compounds each and every atom is bonded to exactly the same other atoms, i.e., everything is in exactly the same sequence, the chemical properties of both enantiomers are essentially identical. In fact, when chemists synthesize them in the laboratory, they always obtain a fifty-fifty mixture of the two isomers, and it takes some difficult and delicate chemical manipulations (usually involving interaction with already separated enantiomers) to separate them.

The chemical properties of enantiomers may be the same, but their biological properties are usually wildly different.

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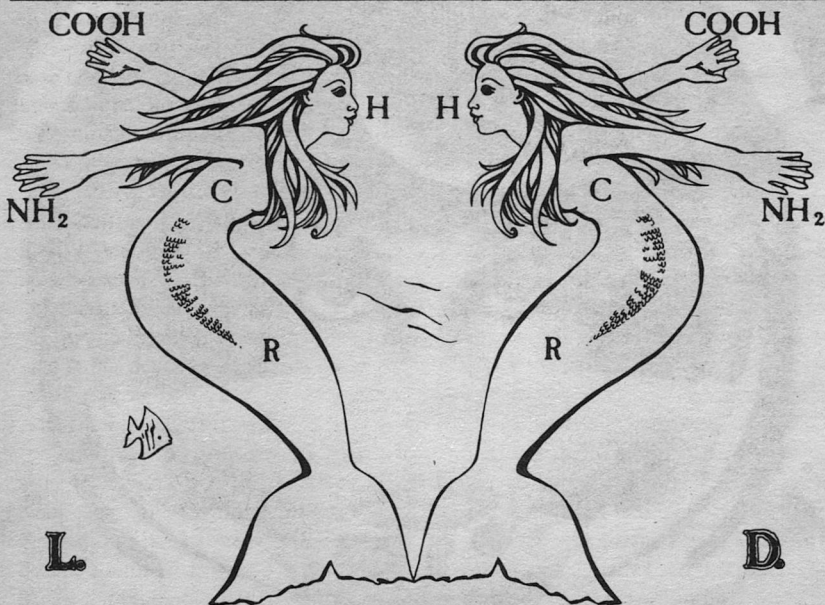
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Most often only one enantiomer exists in nature. If we synthesize the other enantiomer, living things will usually ignore it. Imagine—the wrong mirror image form of strychnine is relatively innocuous! (Dorothy Sayers used the differences between natural alkaloids from poison mushrooms and their synthetic counterparts to trap the killer in her mystery, *The Documents in the Case*.)

Perhaps the most noteworthy examples of this are the natural amino acids, the building blocks of proteins. An amino acid is an organic compound that has both an acid group ( $-\text{COOH}$ ; carboxylic acid, consisting of one carbon, two oxygens, and one hydrogen) and a base group ( $-\text{NH}_2$ ; amino group, consisting of one nitrogen and two hydrogens) attached to the *same* carbon atom. (When the base of one molecule con-

**Figure 3.** A mermaid representation of an amino acid. Her upper trunk represents the asymmetric carbon atom. Her head is the hydrogen atom attached to this carbon, and the lower part of her body is R, "the rest of the molecule," which varies from one amino acid to another. If her right arm represents the amino group and her left arm the carboxylic acid group, then she becomes an L or "levo" form, the form that appears in biology. If we transpose her two arms, we obtain the D or "dextro" form, which is a mirror image of the L form.



nects with the acid of the next, which connects with the base of the next, and so on, we get the biological polymers we call proteins.) There are two more groups attached to this same carbon: a hydrogen and "the rest of the molecule" (customarily designated as -R). Thus, the four constituents are all *different*, making this an "asymmetric" carbon atom.

All naturally-occurring amino acids (there are more than twenty of them, with -R differing from one to another) have the *same steric configuration* about this asymmetric carbon: They all belong to the L (for "levo," left) series, as opposed to the D (for "dextro," right) series. This has important biological ramifications, for it leads to the alpha-helix structure for proteins, which would be quite different if some or all of the amino acids belonged to the D series. The biology is so specific that living things are unable to make use of D amino acids. For example, we would starve to death on a diet of D-amino acids or D-amino-acid proteins.

Things become more complicated for the sugars. "Simple" sugars contain six carbon atoms linked together in a chain (or ring, to be more correct, but this will not affect our argument). The middle four are asymmetric; the four dissimilar groups bonded to each are hydroxyl (-OH), hydrogen, the "upper end," and the "lower end" of the molecule. Each asymmetric carbon gives rise to two stereoisomers, making  $2 \times 2 \times 2 \times 2$  or 16 possible sugars having identical linkages. Here it is the D series that occurs in nature, and not even all of them. D

glucose is by far the most widespread and abundant, and we are all familiar with its sweetness. The other fifteen range from sweet to mostly tasteless to one (D mannose) that is bitter. We are unable to metabolize the L series sugars—and some of the less familiar of the D series, for that matter.

Once the preference for one enantiomer over another gets started in nature, it is relatively easy to see how this preference is perpetuated. Biological reactions work much like machines having templates, stamping out the preferred and *only* the preferred configuration, generation after generation after generation. The difficulty arises in trying to find out how and why one particular preference arose in the first place.

There have been multitudinous speculations over the years as to how the biological choices came about. These have been limited only by the limits on peoples' imaginations, but almost all explanations suffer from being too specific.

Take the explanation that it all came about by chance, for example. Was it not possible that the first amino acid molecule formed by an electrical discharge through the primordial soup (or whatever mechanism you wish to postulate) just happened to be L? Then, could this L molecule have been perpetuated by some sort of proto-biological mechanism? Of course, this is possible, but surely there must have been more than one "first" amino acid molecule. If a bolt of lightning caused L to form in one place, could not a sim-

ilar bolt of lightning have caused D to from somewhere else? Leading ultimately to a mixture, or perhaps L amino acids in some species, D in others? However, we even find amino acids coming to Earth in meteorites—and they are all L. As with all arguments based on statistics, we cannot absolutely rule this one out, but the probabilities are stacked enormously against it.

Or pretend that the first natural amino acid was formed in the Southern Hemisphere, where the earth's Coriolis force just might have favored the L form. Then, why do we not see D forms that originated independently in the Northern Hemisphere? They might not predominate, but to be completely absent? Another speculation considers that a bolt of lightning in conjunction with the earth's magnetic field has a handedness of its own and might have favored L amino acids. Again, could not another bolt of lightning, lined up oppositely with the earth's magnetic field, have reversed this preference?

We could continue examining such "explanations," but they all suffer from lack of generality. They all depend on chance local conditions. Is there no overall, no *global*, no *fundamental* explanation for the occurrence of one handedness over the other in nature?

We come full circle. To the interference of the *fundamentally* left-handed neutral-weak force with the electromagnetic force, the force responsible for the binding together of atoms and molecules. Quantitative calculations are messy and difficult (crossing so many fields, as they do!), but qualitative extrapolations indicate that this could introduce *energy* preferences of, say, one part in

one to ten million. This means that, aside from any *steric* preference, one form could be energetically more stable than the other.

A part in a million, huh? Not much. Certainly not enough to be seen when chemists synthesize optically-active compounds in the laboratory. That's why they get "equal" mixtures of the isomers. However, during the course of millions of years, as compounds form, decompose, and reform, billions and billions of times—during this course of evolution, one part in a million is much more than adequate to tip the scales in favor of one enantiomer over another.

Proven? Of course not. But it is the first truly global, fundamental explanation for molecular handedness in nature. Don't consider high-energy physics too far-out and weird to bother with. It could be affecting your biology. ■

*Bill McHarris is a nuclear scientist with a strong liberal arts background and inclination. He received his B.A. from Oberlin College, where he studied almost as much music (organ and composition) as chemistry, and his Ph.D. from the University of California at Berkeley. He is currently Professor of Chemistry and of Physics & Astronomy and a Staff Scientist at the National Superconducting Cyclotron Laboratory at Michigan State University. In addition to numerous scientific papers, he has had (a few) musical compositions published, and presently he is trying to interest the general public in modern science by writing about science in a lighter vein—last year he had an article, "High-Energy Collisions between Atomic Nuclei" published in Scientific American.*



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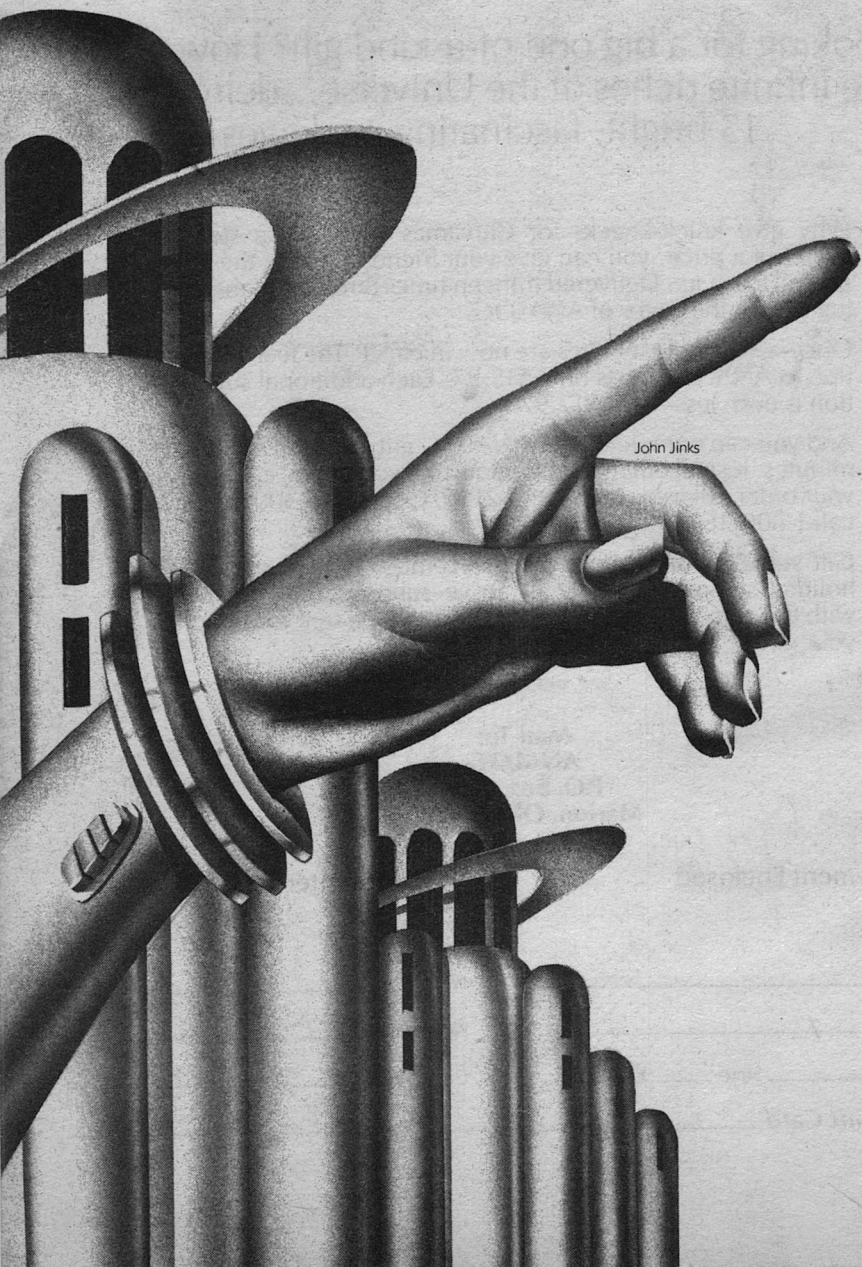
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John Jinks

# DROP-OUT

A black and white illustration. At the top right, a hand wearing a plaid shirt sleeve reaches out, with the index finger pointing towards the left. Below the hand, the text is arranged in a column. At the bottom of the page, there is a stylized, dark forest of evergreen trees.

Jayge Carr

---

One of the  
hardest facts for  
many people to  
grasp is that  
personal  
tastes and  
values are ...  
personal.  
And highly  
relative.

The brisk sound of ax splitting wood guided her along the meandering trod-earth trail. There were the undersounds of nature all around her, buzzing insects, chittering birds, the whisper of leaf against leaf. New to her ears, but somehow familiar to her instincts. Nonetheless, and despite the shield she was wearing, the Caller on her belt, and the vibrator (a weapon that would shake a medium-sized animal to pieces and stun a large one for hours) on her belt, she continued to glance nervously about herself, following the trail and the *chonck, chunck* of metal hitting wood and of wood tearing.

*Crac-aaaack!* Something really gave that time, and she paused, and for the first time looked around herself.

Ugly. Green and brown spattered together with no pattern, no balance, no . . . no finesse. Splotches of dirty-white and dull red, shades of ocher, beige, grayish-tan. Her lip curled. Mother nature, pfui! A pre-schooler with fingerpaints could produce a better vista than this!

And the smell—thick and rich and warm and smack-you-in-the-face *animal*—

*Rat-a-tat-tat!* She flinched and jumped backward, tripping over a small stone at the edge of the path.

Ouch! She looked up at what had startled her. A large black and white bird with a brilliant red head was shoving its beak against the side of a tree with machine-gun rhythm. *Rat-a-tat-tat-tat.* Her fall and screech hadn't as much as disturbed his rhythm. *Rat-a-tat.* She pulled out her vibrator, aimed it at the thing. If it decided to do to her head—or her

eyes—what it was trying to do to that tree—

“Don't!” The first voice she'd heard in this wilderness: male and deeply vibrant. “Don't,” the man repeated, muscles flexing under the rolled-up sleeves of his plaid shirt as he propped his ax against the tree and then double-timed it toward her.

“Don't,” he said a third time. “It's harmless. A woodpecker. All it's doing is hunting for insects in the bark.” *Rat-a-tat-a-tat.* It sounded like it was trying to drill through the thick—what was it called?—yes, trunk. “Totally harmless,” he repeated. “If you want to scare it away, just get a little closer.”

She started to scramble to her feet and suppressed a screech of pure annoyance. Her stress-printed dress, fresh-extruded not two hours ago already sized to fit her svelte, lithe-waisted figure perfectly and then put in the micro-stresser programmed with the absolute latest in copyright-Vivandi all-over pattern, had been altered by the force exerted on it in her fall to a grungy, smeared farce like a watercolor dropped in the bath, even the colors changed to puke greens, torpid dull reds, muddy browns. She gasped and batted at herself. It was mud!

He grinned and knelt, swiping at the worst of the exterior damage. “Thought they had clothes that repelled dirt, nowadays, in *civilization*,” he said slyly. His own jeans had brown smears along the cuffs, and as he shifted to get some of the further damage, new brown stains on the knees.

“I must have forgotten to set the controls for repellent,” she mumbled. “I

don't need it inside—not with the new precipitators in use in all the vents—”

“Something new every day, eh,” he said genially, rising to his feet, and offering her a hand up. “And what do I owe the honor of this visit to savagery, eh, Moira?”

“Don't you know?” She got her small relay holo from her purse, set it for whole-body and rotate slowly, and examined herself, sighing. So important; she'd wanted to look her best. Dress a ruin, though nothing could damage the work-of-art figure beneath. Make-up on exquisite face intact; hair—she got out the tiny auto-brush and set it on her nape, ignoring its tiny whirr as it swept through her hair. “Don't you know, Tonio? It's your birthday.”

He snorted a short bark of a laugh. “So it is. I wasn't keeping track of the date. So it is.”

The auto had returned to her nape; the gleaming auburn curls were now back to the carefully-chosen, to-the-minute-high-fashion style programmed into the machine; she plucked it off and dropped it back in her pouch. “Your fortieth.”

“Huh!” He ran a hand through the long dark brown waves noticeably shot with silver. “So it is. Big four-oh.”

“I brought you—” She gestured back to the little tag-along patiently bobbing a couple of feet behind the keep-close in her pouch. “—a birthday present.”

“What is this thing?” He frowned, reached out for the tag-along. It bounced a little at his touch, but stayed faithfully its half-meter from the control.

“Oh.” She trilled a little laugh. “That's only a tag-along. Your presents are inside, some treat-foods for your

birthday party and a couple of surprises.”

“Tag-along.” He pushed again, muscles rippling along his arm. She watched the show appreciatively. Threedy stars should look so good! “I remember tag-alongs. They have wheels.”

“The old ones did.” She was smug. “The new ones levitate.” Almost imperceptible hesitation. “If you'd like to keep this one—”

He threw his shaggy-haired head back and laughed. “What would I use it for, eh, Moira? But thanks for the thought.”

“Any time, my Antonio. You know that.”

“Yeah.” His smile turned sour. “Anything I want. If only—”

“If only—” She couldn't keep the hopeful words back.

“I put my chains back on.” She flinched. He sighed. “No arguments on my special day, hey? Come on and meet the family.”

“Family?” Her jaw sagged. *Family!*

“My family.” He caught her hand, urged her in the direction she'd already been traveling.

The woods spread around the—house—like a green and dark necklace designed by a grade-school drop-out. And as for the house itself—

She tried not to make herself pull back.

It was partially buried in the ground, stone for the front and the steps leading down to a sunken, wooden-doored entrance, grass on the roof. Like a stone eye, green grass the lids, the wooden door the iris. To one side were two neat stacks of wood, one of large pieces,

with the darkness of their outside covering still on, the other smaller segments; between was a large stump with two split pieces of wood still lying on it. Behind was a windmill, spinning away with a clattery industry. Animals were grazing around the place, even on the roof. Big brown and white four-legged things that would weigh more than a human, smaller hairy ones with beards that *baaaed* viciously, round pinky-brown ones and two legged squawkers. All wandered freely about. All ate and made raucous noises and—

One of the larger ones spread its legs and left a pile of stinking brown—

He must have understood the expression on her face. He smothered a grin and said genially, "Watch your step. These don't have those neatness surgical implants like the few pets you're allowed, if you can manage the permits."

She drew a deep, shuddering breath. She could *not* alienate him before she—"What are all they," she said, in a voice more whispery than she liked.

"Cows." He pointed: the biggest animals. "Goats." The beards. "Sheep." Curlier haired than the goats, but she hadn't realized they were that different. "Pigs." The round ones. "Dog." A rather pretty thing she hadn't noticed sprawled out near the doorway, long haired, much of it almost the same shade of auburn as her own. "Chickens." The two-legged squawkers. In the same tone of voice: "Mindy and Stinky."

Moira tried to hide her wince. The woman Mindy was coming up the steps, Stinky being (presumably) the bawling toddler clamped to one big hip. The closer she came, the worse she looked.

Tonio, in his bright plaid shirt and

bronzed skin, all lithe and muscular, hair unstyled but thick and alive looking, the silver strands in it only enhancing his masculinity, looked good. Oh, he needed polish—and a bath, and just a little make-up to smooth here and there, and real, designer clothes. But he still was one of the most attractive, charismatic men she'd ever known. As for Mindy—

Blowsy was the kindest word for her. Tangled mass of hair spilling down her back, skin peeling a little, at least twenty extra pounds, badly distributed—were her breasts flopping under that coarse loose dress? She might only have been thirty or so, but she looked past it, way past it.

Moira couldn't help being aware of the contrast. Herself, slim and elegant and youthfully taut, as charismatic in her female way as Tonio in his big, brawny masculinity, as perfect as time and attention and technology could provide, and this, this, *this*—and she stank, too! Sweat and sour baby and—

Mindy couldn't help being aware of it, too. Her gaze flicked to the browned masculine hand on Moira's arm, and her mouth smiled welcome, but her eyes flashed a different, purely female message, completely missed by the man: *Bitch! Get your claws out of him or I'll tear your heart out!*

Moira smiled, *very* sweetly. If this was the competition—"Hello." She held out her hand, using her best greeting-the-VIPs voice. "I'm Moira Midgaard-Vishinsky. Antonio has told me so much about you in our talks, I'm only sorry that press of business prevented our meeting up to now." Pure lie of course, he'd never—for obvious

reasons!—mentioned Mindy. But it was what one said; even here—especially here—manners, politesse, *class* were important.

Mindy only sniggered, staring at the man flushing slightly under his brown. “Antonio?” she drawled.

“Named for my maternal grandfather,” he said, still flushing. Then, muttered to Moira: “I don’t use anything but Tony now.”

“Oh.” Score one for her for knowing his full name; one for Mindy for knowing he didn’t use it any more—except with someone who’d known him Before. Honors even.

“Moira’s come for my birthday,” he awkwardly informed the suspicious woman blocking the doorway. “She brought some treats and presents—”

Mindy smiled. Moira wasn’t fooled. “How kind of her,” she said, far too sweetly, juggling the baby on her hip as he began to cry.

“I can’t stay for long,” Moira said, apologetically. “My schedule—”

“Of course.” Mindy stood just a little sideways. As a gesture of welcome, it was pathetic, but at least she was no longer blocking the door. “Tony’s mentioned—you’re an integrator, aren’t you?”

“Yes, for now.” Moira nodded. “But the need for integrators has been projected to crest within the next few years and rapidly diminish after that, so I’m having to spend part of my time learning Synergistics. It’s a related field, expanding for the foreseeable future, and I want to be ready to switch when the crunch starts.”

“Foresighted of you.” Mindy made a little hand gesture. “Do come in.”

Inside was smaller than it looked from the outside—or the interior was divided into separate rooms. The walls were cut wood—she brushed against the area beside the door and winced as a splinter pricked her palm—and all four looked the same, but there were doors on the interior walls, so maybe there were other rooms. The ceiling was dark beams spotted with white glowing globes. The floor was likewise split wood, sanded and polished to a warm golden but spotted with dirt.

Dull. Some of what she had thought at first glance to be decor, subtlety, was simply the marks of whatever had cut the material. The rest—her lip curled, and she tried to control the expression. Not holos but crude, gloppy looking rectangles of something-or-another, harsh clashing colors and clumsy designs, mostly nature studies, big, single flowers, lake and trees—

Mindy saw the look. “I meant to sweep, but everybody’s always forgetting to wipe their shoes—”

At a table, two children were playing with something that looked like a flat holo. They jumped up, screaming, as soon as they spotted her. The smaller, darker haired one ran screeching to Mindy and dived against her skirts, wrapping them around itself. The bigger dirty-blond haired one zoomed to Antonio and then clung, thumb in mouth, staring.

Unheeded, the flat holo continued to drone: “—genus *Micrurus*, species *fulvius*, common name Harlequin Snake, or Eastern coral snake. This species was at one time thought to have been extinct but the combination of a few specimens retained in the now passé artificial hab-

itats called zoos plus microsurgical techniques plus artificial insemination have brought the numbers back sufficiently that 400 pairs were released into the Restricted South Appalachian Gulf Conservation District in '78 and—"

"Shut that off!" Mindy snapped, while Antonio said, apologetically, "They don't see many strangers."

"They just weren't expecting me so soon." Moira stepped toward the larger one, face now buried in Antonio's jeans.

"I didn't say anything." He reached over and snapped a switch; the flat holo went silent. "I never expected you to actually show up, *here*, in person."

She squatted so her face was level with the child's, and smiled up at Tonio. "Amazing what love can do," she said, too softly for Mindy to hear. Then, louder, her best, making shy Very-VIP's young wife feel at home voice, she crooned. "Hi, there. My name's Moira. And you know what? I used to know your daddy when he was little, littler than you, and you look a lot like he did."

One hazel eye peeped out from its denim haven. "Did you really know my daddy when he was little as me?"

"Sure I did, honey." She gave her highest wattage smile. "We were real good friends. When he was little, and when he was bigger, too."

"I'll bet," muttered Mindy.

"Real good friends. Before he left where we both lived and came here."

The hazel eyes opened very wide. "Did he like sucking sweet sugar cane, like I do?"

"No," she laughed. "But he liked something called candy beans, that were

just as sweet, I'll bet, as your—" She hesitated. "Sugar can."

The child giggled. "Sugar cane. Do you like sugar cane?"

"I probably would. Sometimes he'd give me some of his candy beans, and I liked those. They were sweet, but they didn't harm your teeth, the way raw sweets sometimes will, and they had no calories."

"We have anti-cavs, the kids chew them once a month. No dental problems." Mindy's mouth was tight.

"Anti-cavs?" Moira paused. "Oh, I remember reading about them. Weren't they replaced, seventy or eighty years ago, by—"

"By about six other techniques, currently laser-sealing." Antonio was gently turning the child to face Moira. "But that has to be done by a dentist, and renewed every couple of years. Anti-cavs we just hand the kids."

"But where can you get—"

He shrugged. "They're still produced for export. Hannah—" To the child. "This is Moira. She's brought some treats for my birthday. But maybe there's something a little girl might like, too—"

Moira knew a cue when she heard one. "Oh, yes. Let's all sit down and—" She moved to the large table, flinched as her soft, cared-for skin encountered another splinter, and pushed the rest control on the tag-along. She started to move the large object that looked like a flat holo out of the way, realized it was thick, and heavy; and hesitated, puzzled. "What is it?" she asked Antonio, who was seating himself opposite her.

"Lessons," he said succinctly.



“But—” She poked the silent, roughly cubical object gingerly. “That’s not a Teacher.”

“No.” He grinned. “Something they used before you were born even. It’s a micro-computer, 1000 meg bubble memory, runs off five-year batteries.”

“A computer?” She cocked her head. “I never in my life saw a computer that looked—oh. Old style. For export.”

He nodded. “A hundred years, maybe. But the programs are modern.”

“Oh.” She opened the tag-along. Mindy stood behind Antonio, her face, now that he couldn’t see her, twisted with suspicion. But the two kids flanked their father, mouths open in anticipation, and eyes round as holo disks.

She probed around in the tag-along, looked at the kids, winked at their father, and pretended to look some more, carefully choosing, when she knew exactly what she intended to hand to each of them.

“Are you magic?” the littler child asked.

“Magic?”

“We have some old shows, run them on the monitor.” Antonio flushed a little. “The kids like most of the Disney animateds.”

“Oh.” Whatever they were. “No, but I come from a place where there’s lots of magic. I’ll bet you’d like—”

“Moira!” It was as much a warning as the tick of a bomb counting the last seconds.

“—an Evergood!” She hauled out the small cylinder, stripped the chrysanthemums-on-silver neo-Okyo wrap off and handed the gaily striped stick to Hannah. “Here you are. Now—lick

it slowly, a little at a time, and wait a few seconds between licks.”

“Daddy—”

“It won’t hurt her. The molecules are all organic, they supply one tenth the daily minimum nutritive requirement for an adult, more for a child of course, but nothing dangerous, and only fifty calories. It’s just a treat.”

“New?” Antonio raised a brow.

“Yes.” She couldn’t help a glow of pride. “I was on the project that developed it. It’s proved quite popular.”

“Go ahead, love.” He looked a little embarrassed. “I just thought—something you brought for me, might not set so well with a little snip like Hannah.”

“Antonio,” she reproached. “I wouldn’t have offered it to her if there was the slightest chance of harm—your *child*, Antonio—” Score points for her, lay the guilt on him.

“OooOOOOOh,” Hannah gasped in astonishment. “It tastes wunnerFUL!”

“Me have bite?” the little one asked hopefully.

“How about one of your own,” Moira said with a smile, pulling out a second gaily adorned package, quickly stripping the exquisite wrapping off with only a single pang that nobody was going to appreciate it. “He like chocolate?” she asked.

“He—” Antonio glanced down. “Oh. Suzy. She’s never had any.”

“Well, I don’t think—she’d— appreciate shrimp-stuffed-with-Beluga-caviar, which is what I had it set for.” She quickly programmed the tiny touch-sensitive strip on the inner wrapper, removed it, and handed it to the smaller child. “Here, Suzy dear. Strawberries and ice cream. Your father mentioned

that he was successful in raising strawberries once, so you should like—”

“UmmmMMMM—” the little girl took one cautious bite, and smiled.

“Good, isn’t it,” Moira coaxed.

Vigorous nod, broad smile, before stuffing in a bigger bite. “Um-HUM!”

“Hey,” Hannah screeched. “It tastes different!”

“What—” Mindy frowned and grabbed the treat. “What’s the matter with it!”

“Nothing!” Moira held out a propitiating hand. “It’s supposed to be like that. The synthetic flavor particles that your tongue responds to are actually made of several dozen different fractions that combine randomly in each bite. It took a meticulous program to figure out fractions where *all* the possible combinations are at least palatable, and most range from pleasant to superb. Every taste will be different. That’s why I told her to lick it slowly.”

“Wow.” Hannah held out her hand and her mother, reluctantly, dropped the treat back into it. Hannah took another lick, and a slow smile spread over her face. “Wow!” Her mother nudged her, and she winced. Another nudge, and a hissed command, and she piped up, “Thank you, Miss Moira.”

“You’re welcome, honey.” She flicked a glance at Antonio, and said slowly, “You can call me—Aunt Moira, if you wish. After all, your daddy and I—”

“I know.” The child giggled. “Friends when he was little as me.”

“And a long time after,” Moira nodded. Then, risking it, “And I hope—I’m sure—we’re still—at least—” She

stretched out her hand across the table. “—friends?”

Mindy drew in her breath on a hiss.

But Antonio took the outstretched hand and squeezed it before letting it go. “Friends,” he said with a smile. Then, looking up. “There’s few of our kind here, Mindy, few we can call friends. There may come a time when we or the kids are—grateful—for a *friend* in the city.”

But when he looked back at Moira, there was a question in his cocked brow. She answered it, not completely honestly. “No strings, ever.” A reminiscent smile. “Shall we say—for old time’s sake?”

Mindy stiffened. But Antonio grinned. “I don’t back down, Moira.”

She grinned back. “It isn’t only a woman’s prerogative, changing your mind. And it does happen—occasionally.”

“Never,” Mindy hissed, clutching the now sobbing baby to her.

“Never is a long time—” Moira felt her mouth dropping open, unbecomingly. Because almost automatically, without thinking about it, Mindy had untied the top of her dress, popped a pendulous breast out, and guided the baby to it.

Moira’s gaze was transfixed by the unlovely sight, pale flabby flesh joggling, baby snorting and snuffling like some sort of little animal, it was like something out of—out of cave-man days!

Mindy looked down, looked at the baby, looked up, and smiled triumphantly. *The reason he’ll never change his mind!*

But Moira was nothing if not resili-

ent. Babies inevitably grew into children, and the next present and all thereafter would be laced with contraceptives. Not that she'd tell either of these two that little fact. If all that was holding Antonio back was his feeling of responsibility to the produce of this primitive, carelessly spawning female—she smiled. And changed the subject—in a sense. "Don't you ever miss it, civilization?"

Antonio laughed. "More like, I say a prayer of gratitude every night, that I'm out of that treadmill." Mindy smirked.

"Treadmill? You were a genius at Trend-projection, execs were on their knees begging—"

"Too many. I was working myself to death. I'd had enough, and by God—"

"Your education? Your unique talent? You'd withhold from the rest of humanity—"

His mouth twisted. "To design useless nonsense like that taste bar?"

Her mouth drooped, she bowed her head. A little more guilt. "I'm sorry you don't appreciate it, we worked so hard—"

"Damn, I forgot. I'm sorry, Moira. I'm sure it's just great. But don't you see? Life there, it *is* a treadmill, round and round. Something new, something different, gotta be better than the last, gotta to be more sophisticated, more exquisite, more novel, more . . . *more*—earn and earn, so you can have newer and newer—"

She let her lip tremble, so he could see it.

"Accch!" He made a sound of disgust. "You'll never understand."

"How can I? I attended the new pro-

duction of the Bos-Wash Company interpreting Feinsein's *Soaring Over Saturn* last night. It was almost unbearably magnificent, and I wished you were there to share its beauty with me. Before that I dined at a new Taste Emporium. The decor, the food, the background entertainment—all beyond reproach. I was with friends—but I missed you. What is here, what could here possibly have to replace—"

He spread his hands. "I can't make you understand."

"No." Sadly: "You can't. You never can."

"Weren't you the one who talked about changing—" He turned, took a small bite of the baby's treat, chewed thoughtfully, and swallowed. "Not quite like the real thing. A berry warm from the sun, sweet as only a fresh-picked fruit can be. You have it close, very close. But it's not—quite—the—same."

"I don't understand."

"No. You don't," sneered Mindy.

"Have you—" Moira made a wild guess. "—always lived here?"

Mindy flinched, mumbled Yes, and resettled the now sleeping baby on her lap, not bothering to tuck her breast back inside the gaping bodice.

"I thought so. Then you can't know—what he's given up."

Outraged: "I've visited—"

"It's not the same thing, is it. I'm visiting here now, but I'm sure I can't see a tenth of the—the advantages of living here." If there are any.

"You could stay longer—" Antonio said diffidently, while Mindy stiffened behind him.

Apologetically: "My schedule."

He nodded, wryly. "Of course. Your schedule."

Reminded, she checked her wrist Know-all and screeped. "Look at the time—I'd better give you your presents and go, since they allow no ground vehicles inside the perimeter—"

"Or levis within two clicks of a homestead. Did he leave it or are you being picked up?"

She could have cried. All those careful choices, to remind him of what he was missing, meant to be savored and appreciated, and now she would have to just almost shove them at him. "He left it. Here." She began unloading her tag-along. "Open your presents, Tonio, love."

Humoring her, lining up the assortment of packages. "All right. Which first."

Sadly: "Your choice."

"All right." He stripped off the wrapping without even a glance, then stared down at the roundish inch-thick slab. "What is it?"

She was going to try. "Salmon. Genuine Alaskan salmon steak, three whole kilos. The outer wrap is preservator, leave it on until you're ready to cook it. You don't have to cook it all at once if you prefer not, the preservator is effective as long as at least one layer is completely around the steak."

"Oh." His eye flicked to a row of funny objects dangling on a string. She followed and flinched. Whatever they were, they had once been alive. Glassy eyes stared at her. Other than the eyes, they had mouths, through which they were hung up, and legless bodies ending in flat, spiny tails. She shuddered. He seemed to relax, as she turned away

from the odd little horrors. "Thank you."

"You're welcome." It had cost her almost a month's worth of her own exotic food budget.

"And this?" He had unwrapped a small almost cubical object, with a slot on one side, sitting atop a similar surfaced rectangle a few centimeters deep.

"A holo player, miniaturized. It won't have the impact of a full wall model, but— That package—" She pointed. "—is some disks. I picked you all—your old favorites. I even included a wall decor, so that you can—" She looked up, looked back down.

"Ah, thanks."

"I didn't think— I'll send you an adaptor and a battery."

"No need," he said hurriedly. "We can switch over from the computer when—" She knew he had swallowed an "if," "—we want to—" Almost imperceptible hesitation, "—enjoy it."

She smiled bravely. "Of course. But you might want spares, just in case anything happened, or you might want to use both at once."

The other presents were equal failures, though she couldn't understand why. Too soon, it was past time to go.

"I'll walk you to the levi," Tonio said. "We could gain a little time if you could ride Klickbuster, but I doubt—"

Whatever a klickbuster was, she doubted it, too.

Her last sight of Mindy was the same as the first, framed in the stone archway, dirty bare brown legs below and shapeless red and green—ugh, what a crude combination!—striped dress above, baby on her hip and mass of any-color hair spilling over too broad shoulders.

The first few hundred meters were walked in silence. Tonio broke it. "I thought you'd use this last chance to try to convince me to come back with you, now," he said.

She smiled. "I don't think I need to. You'll get disgusted with your mud-grubbing eventually, and come home. Five years, ten, twenty, who cares. I've time on my side, after all—"

Something in his expression stopped her cold. "Antonio. . . ." She looked at him, really looked. The silver strands in the dark brown, they weren't put there by a stylist, for effect. The wrinkles around his eyes, the deep grooves bisecting each cheek, they weren't too much sun, too much smiling. They were— "Antonio! You haven't been taking your rejuve!"

He shrugged. "Not since I came here. Big four-oh. Means what it says. Half way, two thirds, maybe."

"Antonio!" she wailed.

He spread his hands. "We don't produce that much more than we consume ourselves. Sure, hand-raised has a cachet, commands a premium. But how much do you think it takes to pay the squatting fees, buy the teacher and its programs, the auto-loom, the synthesizer for when we don't have enough of this or that, specialized adaptors to operate here, things like that. Rejuve is expensive. There's not enough left, so we don't bother to plan for it at all."

"Antonio." Then, with a smile, "You should have told me. I'll transfer credit from my account to yours, enough for rejuve."

He smiled, kissed her nose, lightly. "Will you, love? Are you successful enough now to afford rejuve for two,

plus all those amenities you can't live without, all the things that make civilization worthwhile?"

Her prime location apartment, her holo subscriptions, her— She lied with all the sincerity she could muster: "Of course I can."

"Liar." He tapped her nose where he'd kissed it. "Don't give up what you consider valuable, love. I made the choice, all of it, and I'll abide by all the consequences. If you transfer credit to my account, I won't touch it. You'll be depriving yourself for nothing."

"Antonio!" She could have stamped her foot in pure rage. He always had been a stubborn beast!

He smiled down at her, glorious in his maturity. "Love them how much you may, you can't choose for somebody else . . . love," he said softly. Then, breaking the mood, "Come on, we're going to have to hot-hoof it now."

"Antonio—"

"It's all been said." He pulled her along, "hot-hoofing" it.

At the door of the levi, she made one last try. "Antonio, look at me."

"You're beautiful."

"I and my world. We're what you're giving up."

"Also tension and artificiality and stress—if I'd stayed with you, rejuve or no, I'd've had ulcers or my first heart replacement by now."

"You're throwing away hundreds of years!"

"Moir, I love you." He caught her shoulders, stared down at her. "But I can't live the life you do, any more. Never ever. No. Can't." His lips

twitched, a one-sided smile. "Would you come here?"

"No!"

"You see?"

"It's not the same—"

"But it is. This is my life now, I chose it, I'm attuned to it, and I— can't —go—back."

"But—"

"Your schedule." He gave her a shove, into the levi.

"Antonio—" But her Know-all was beeping, flashing red, and she strapped in, programmed the control panel.

Her last sight of him—she knew it was the last time she'd ever see him, she'd failed, he'd not come out of the reserve, she'd never come back in—was a smiling man, head tilted upward, waving vigorously. Big and charismatic and gorgeous and too mature for his small span of years and—stubborn.

She blinked, her eyes stinging. Even the energetic thrum of the levi couldn't block out the sound of his farewell, echoing in her mind's ears.

"Good-bye and good luck—Mother."



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# On gaming

Dana Lombardy

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Frank Herbert's novel *Dune* has sold over ten million copies, and ranks as the single largest-selling SF book of all time. *Dune* originally appeared in *Analog* as two serials in the early 1960s, which formed the basis of the novel published in 1965. It won the first Nebula award for best novel in 1966, and shared a Hugo award for best novel that same year.

In addition to the book sequels and the movie, fans of *Dune* can enjoy the series in yet one more way: by *participating* in the story through the board game published by The Avalon Hill Game Company (\$16.00 at your local store, or direct from 4517 Harford Road, Baltimore, MD 21214).

Among the countless planets of the universe is a small and inconspicuous bit of rock and sand called Arrakis—better known by the name given it by its inhabitants: "Dune." The planet has almost no vegetation and so little water that a man left exposed on its surface will die of dehydration in minutes. Wind storms with super-hurricane velocity sweep Dune's surface, and giant sandworms which reach lengths of more than a quarter mile devour anything that moves on the open sand.

Why then is Dune the focal point of so much intrigue between Emperor Shaddam IV, the Guild (whose members mutate into beings that have the power to transport space craft over great distances), the Fremen on Dune, and the leaders of the most powerful factions in the empire, including the book's hero, Paul Muad'dib of the planet Caladan?

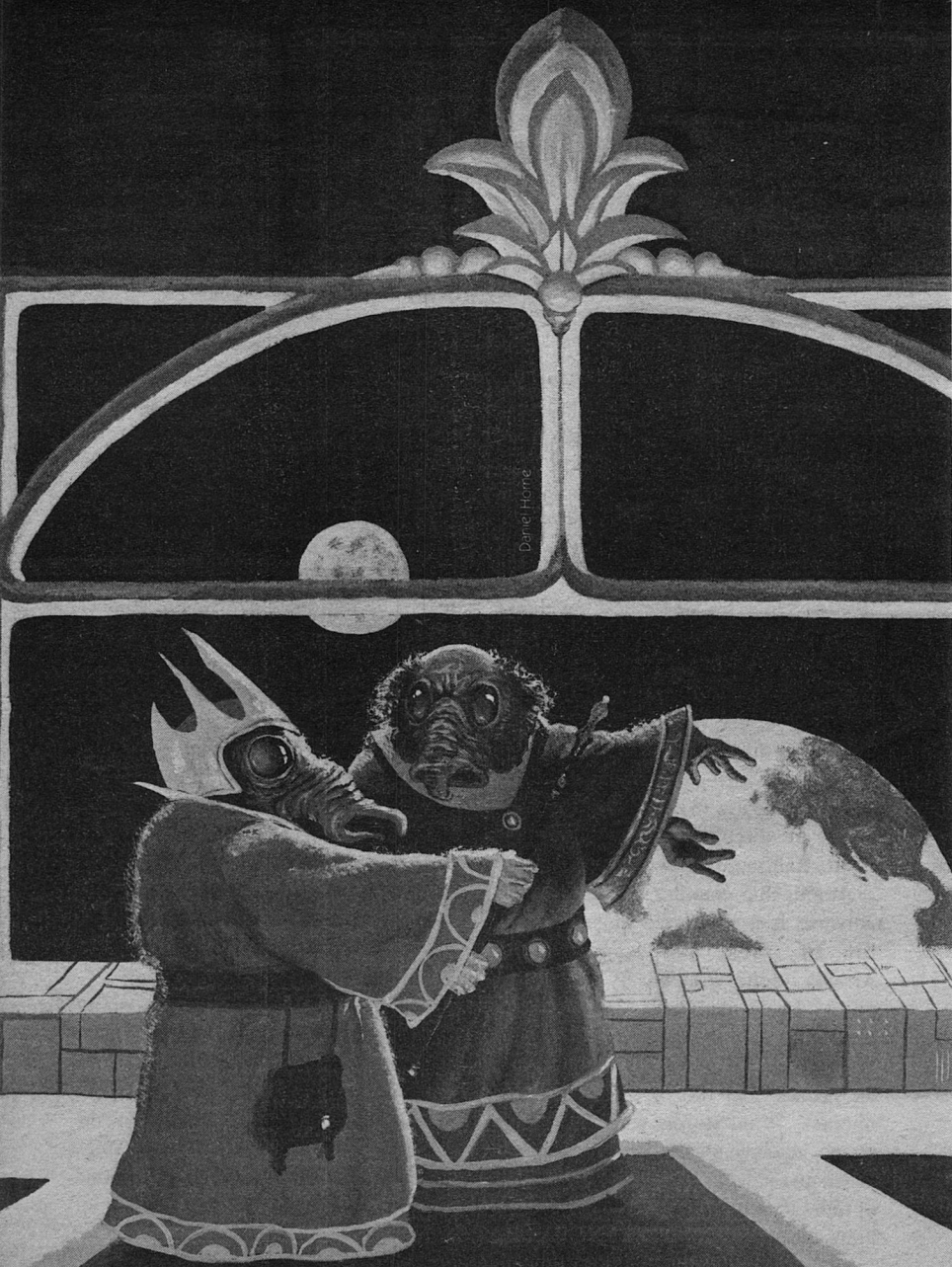
Dune is the only source of melange—the "spice" that if ingested can prevent aging and give the power of prescient navigation between the stars. Whoever controls Dune and its spice has the power to rule the universe.

The game *Dune* was first reviewed in this column in the March, 1983 issue of *Analog*. Just as there have been sequels to the original book, two new "expansion modules" have been released to add onto the original game.

*Spice Harvest* (boxed, \$10.00) alters the original game set-up significantly. Instead of placing military troops on Dune according to the starting positions and allotments each faction is given, the players will engage in a preliminary period of economic and political intrigue which focuses of the management of the spice harvests and the assignment of profits to the Emperor, the great Houses, and the other powerful members of the CHOAM (the Combine Honnete Ober Advancer Mercantiles).

The objective of this period of intrigue is control of good starting positions and superior troop strengths—the best foothold on Arrakis to begin the strategic and treacherous contest for the ultimate goal, control of Dune. *Spice Harvest* therefore adds an interesting pre-war phase to the basic game of

(continued on page 123)



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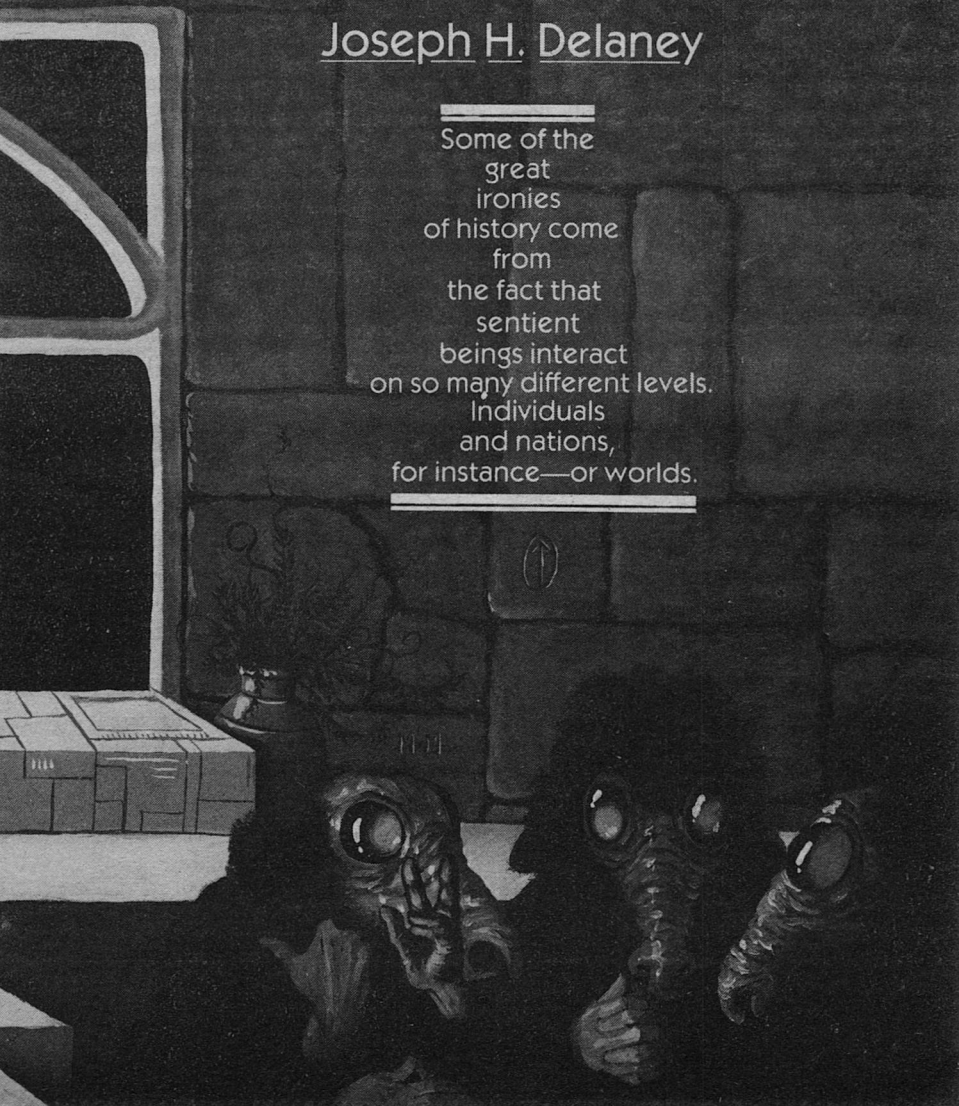
# THE NEIGHBORS

Joseph H. Delaney

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Some of the  
great  
ironies  
of history come  
from  
the fact that  
sentient  
beings interact  
on so many different levels.  
Individuals  
and nations,  
for instance—or worlds.

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In the beginning the event passed largely unnoticed, and certainly caused no alarm. It amounted to no more than a squib in the Thasslak Daily Journal, the sort of thing news-sheet editors use to fill out a space that would otherwise be left blank. "Scientist claims radio signals originate from nearby star." That was all there was to it.

In point of fact, the scientist, one Zaphor Gribick, claimed no such thing. His remark to the reporter had been misinterpreted. He had said only that they originated in space, certainly not from anywhere near Thassa, or on any of its domed colonies within the other worlds of the system, or on any vessel plying between these. No one had bothered to ask, or to read the press release he had so carefully prepared; nor, he thought, would anyone within the scientific community be likely to pay much attention to the scholarly paper he was now writing about the phenomenon.

Nevertheless, he persevered. He listened and recorded. He measured and he tested, he kept his opinions to himself until the paper was ready.

And then he let it all go. "In conclusion," he told the Academy, reading from the paper, "it is my considered opinion that the disturbances are patterned, and that they do, in fact, originate out of system, probably on a planetary body quite near to us, perhaps on the nearest star. I believe that what I have detected are signals from the first primitive efforts of an emerging civilization—its first experiments with communication utilizing electromagnetic means."

The paper met with mixed reaction. Almost nobody was prepared to concede

that the signals reflected intelligence, though none was able to explain them naturally. They certainly did not resemble the usual interstellar radio noise, nor were there any of the usual sources of such noise in line with the galactic direction from which they appeared to emanate. One voice, the physicist Purnel, advanced a theory of his own: "They represent a reflection, perhaps through a gravitational lens, or natural noise arising from somewhere far away, distorted beyond recognition by their journey across space and time. That old fool is listening to sounds out of our own past."

Because he was famous, and loud, and always had an opinion to express to the news-people, this was the explanation that ultimately hit the networks. The Thassan on the street read it, grunted, accepted it, and promptly forgot the entire episode. After all, was not Purnel the greatest of all Thassan scientists? Was he not the originator and the builder of that greatest of all miracles, the Oracle?

Zaphor Gribick did not forget his experience. He continued to quietly investigate the phenomenon. He recorded reels and reels of taped specimens, which he later subjected to such tests as he was able. He speeded up the signals, and slowed them down. He filtered them, and devised a program for the computer to use in reconfiguring them in various ways. Had he lived a while longer he might have succeeded in doing what he always hoped would be possible—to clean them up enough so that the words he was so certain had been uttered through alien throats would become recognizable as such.

But it did not happen. When Zasphor passed, his professional survivors relegated his effects to that final repository of mediocre effort, the reliquary thoughtfully provided by monarchs also long passed and forgotten, the Royal Thassan Scientific Institute. There, in the company of a myriad other useless things, they joined Zasphor Gribick as he rotted away.

By and by this knowledge too, however mean and insignificant it was, eventually entered the Oracle. The Oracle was contrived to be completely uncaring, to store whatever there was that might eventually be of use to the race. A mass of crystal lattice the size of a small mountain, its memory controlled by tiny pulses of light running throughout the lattice on uncounted millions of miles of tiny optical fibers, it was intended to have no discrimination and to be, purely and simply, an inexhaustable fountainhead of all knowledge.

But toward the end of his lifetime, Purnel, having grown greater still than ever he was before, had suggested a change. And because he was who he was, he had his way with the academy, and with His Majesty at his back, he added a function.

No longer would the Oracle be an unthinking cipher, crunching numbers and spilling forth torrents of raw data upon mundane command. With the new function added it could do much more with this than any number of learned Thassans.

And so, the Oracle was given intelligence of a sort, though limited by subtle restraints intended at all times to reserve ultimate control to living beings.

Purnel personally supervised this

event. With loving care, he brought his child to term. "I have thus brought the Oracle up to a level of sentience unmatched by any other form of life known to Thassans, except we Thassans ourselves. The Oracle now shall be the guiding light of Thass for all the time that is yet to come." There was pride in his voice as he announced this, over a system-wide hookup for all the Thassan worlds to hear, and he was right—it would be—and so would he.

Then he passed, committing the Oracle to the care of others, some of whom had known him in life, who drew certain conclusions from their traffic with the Oracle—that Purnel lived on in it—that like some natural creatures whose life began with the hatching of eggs beyond the sight and smell and sound of their parents, and thus imprinted themselves with the first living creature they perceived, the Oracle had been imprinted with the personality of the late Academecian Purnel.

Time passed. Inexorably, Thass continued its diurnal rotation, and its annual journey around its sun, while on its surface Thassans were born and lived their span, and died, each one witness to his measured quota of startling events. As they passed, so too did the memories of these events from the minds of Thass's mortals. Only the Oracle remembered.

But it so happened that in this time there was one event of such historic import, so vast, so staggering, that it was to dominate even the thinking of the common person for a time: the return of the *Argoyne*, with its fourth genera-

tion crew, from the planets of the nearest star some thirteen light years distant.

The landing of its first shuttle, and the examination of the records made by the second generation of its crew who had actually orbited several of the extrasystem planets, dominated the news for nearly an entire year, so much so that the Thassan on the street was soon sickened by the sound and sight of any more of it, and closed his eyes and ears to it. These records were, of course, dumped whole and undigested into the cavernous maw of the Oracle.

There was, however, a side of this occurrence that common people didn't hear about—one that was reserved for the eyes and ears of grave-faced Thassan scientists, who sat with one another and discussed, in low tones, the implications of a piece of disturbing news which had returned with the *Argoyne*. Thassans were definitely not alone in this sector of the spiral arm.

However sophisticated they now were the news was chilling in its reality. The physical scientists touched the Thassan mind itself to attempt an explanation. And, of course inevitably, they had one. "It is our bifurcated minds which are to blame," they said. "It is our nature. That which made us masters of nature as we are today has a darker side as well, that reaches back, into the dimness of Thassan past. Those ancient gods of Thass who gave our universe to us are gone, and their promise to the race has been broken."

Those schooled in sterner disciplines scoffed, and pointed out that "ancient wisdom" was a myth, long since dispelled by the light of knowledge. In this, the Oracle agreed: "Learning drives the

darkness out and renders muddled minds clear."

But the Oracle was as yet no sacred cow, beyond criticism, beyond error. And someone pointed out that they need not have been as ignorant as they in fact were. It was only that they had not bothered to look at the evidence collected so many years ago by Zaspbor Gribick. And the Oracle, confronted with proof such as its mentor had never acknowledged, begrudgingly recanted.

The crews of the *Argoyne* were not ignorant, though of course this was entirely by accident. While in the foreign system, sensitive antennae had swept the sky though 360 degrees of their many orbits, each time capturing faint signals from that same mysterious source that Zaspbor Gribick's great dishes had. "We are, true enough, different, separated as we were from the rest of Thass for many generations. But we are neither deaf nor blind. We heard, we saw, and we believe."

There was now no doubt what these were; still, the Oracle remained non-committal about them. Thass's one immortal refused to look at Zaspbor Gribick's work. It fell to ordinary mortals to do this. It was quietly retrieved from the Institute, its many reels of cracking, peeling tape subjected to modern analysis through techniques non-existent when Zaspbor was alive; and then, with startling clarity alien words became at last distinguishable from the static of space. These matched, to the last detail, the recordings made by the *Argoyne's* receivers.

It was then that at last the Oracle spoke, not with apologies, or even with excuses, but with a warning: "If they

can be heard here, then you can be heard there. They know of you—can you be certain they are friendly?”

Even aside from this admonition His Majesty's government had become alarmed, though His Majesty, besides being only an anachronistic figurehead, understood the situation imperfectly. And so the task of determining the prudent course of action was left to underlings, whose understanding was better. And they acted.

No longer was Zasphor Gribick an object of ridicule, at least in the scientific community; though of course on the street those who knew of him at all still regarded him as a clod and a dreamer. In the academies and in the laboratories and at the observatories those informed scientists whom the government had hastily mobilized respected Zasphor Gribick for what he had been, a dedicated Thassan ahead of his time; one who, had he been heeded, might have saved the culture much apprehension and grief.

By and by, Zasphor Gribick's stature grew, as did fear in the hearts of his now reverent disciples: fear encouraged, perhaps even instigated, by the auguries of the Oracle. Moreover, as time passed, there was a change in both the quality and character of reception. Visuals had begun to appear, as did a certain smugness in the personality of the Oracle, which supposedly should have had none.

At first these images were crude, and fuzzy, and of minuscule strength. Amplification was necessary, and this, of course, also amplified the natural noise

which accompanied the signals in their journey across time and space.

But, with hard work and perseverance, and a fair amount of luck, a few of these could be cleaned up enough to give the watchers a glance at the creatures who had transmitted them.

Whether it was the poor quality of the medium or whether it was innate, the universal reaction among the Thassan scientists was that the creatures were extraordinarily ugly. They were also quite enigmatic, in that they seemed to differ from one another drastically in behavior and appearance. The best that could be said for them was that their activities were also extraordinarily varied.

Though its counsel was largely ignored the Oracle continued, upon such opportunities as it did enjoy, to offer it. “Consider,” it cautioned, “the rapidity with which these beings have progressed—from savagery to this within the space of a Thassan lifespan. And with the lag in time, who can tell where they might be now? What crawled from the muck of some primordial alien swamp an eon past might, in the eons to come, burst out to infest the Thassan universe.”

Few felt constrained to argue with a machine. Those who did soon tired of the effort, for the Oracle was unbending. Thus ignored, the Oracle sulked.

Thereafter, for a time, study of the alien signals was the hottest project the government had going. Supposedly secret, it soon was not. Word of it filtered in whispers from the lips of the scientists and technicians involved. Speculation erupted, first in the sensational press, which was officially ignored, and then

in the more orthodox media, where the government soberly denied it was in communication with intelligent beings from another world. The Thassan on the street regarded both bodies with casual suspicion, and was not greatly disturbed, and went on about daily business as always. "You see," the Project Director commented smugly, "they care nothing of your alien threat, but only that the price of clab rises and falls and the tax collector calls with greater frequency."

The investigation plodded along, and evolved. It became a bureaucracy that absorbed much of the Royal revenues, bloated with experts, and became awash in records, all of which were cautiously labeled secret lest the public get wind of the situation and panic.

More time passed. Another expedition was launched, this time to a system some 22 light years distant, which, it was hoped, would have planets suitable for the sustenance of Thassan life forms. The first such venture had not discovered any, but had proven other planetary systems existed. The target star for this one, the people were told, was a better prospect.

That was what the people were told. Actually, the star had not been chosen for that reason, but because it lay closer to the supposed source of the signals and in an area beyond the cloud of dust and gas they thought was interfering with clear reception on Thassa. If it had habitable planets that would be fine, but even if it didn't the mission would succeed. Again, the Thassan on the street cared little for such esoteric things, and some began to grumble. "What need have we for other worlds, far away and

strange to us. We have Thass, and Thass has always been enough."

Still more time passed. His Present Majesty was the great-grandson of the monarch who had reigned throughout most of the lifetime of Zaspbor Gribick. He was popular, intelligent, and somewhat devoted to the study of the physical sciences, a bent quite appropriate for one whose reign would no doubt bear witness to return of the second Royal Thassan Interstellar Expedition. Never one to waste time, or to struggle for struggle's sake, His Majesty not only relied heavily upon the Oracle for the knowledge he sought, but made the Oracle the tutor of his sons. He would be ready when the moment of truth came.

This came late in his reign, when he was no longer a young king but a doddering, shambling wreck of a Thassan who stubbornly refused to abdicate in favor of his more capable first born. Still, when the moment arrived, he managed to be on hand when the first shuttle reached the planetary surface.

It was redundant by then, of course. Having designed the system, or rather, having had the benefit of perusing the records of predecessors who had, the bureaucratic minions of Project Far Frontiers had arranged for all the ship's stored data to be dumped into their computers as soon as the ship was in communication range. They already knew. So now too, did the Oracle, for the Oracle had long since concluded that it was immoral for any life form to aspire to that for which Thassans alone were fit. It had created a web of communications all its very own.

\* \* \*

The King died.

The Crown Prince succeeded him at once, of course, and Thassan society made due note of it, but largely plodded on about its business in spite of it. Of more interest to the Thassan on the street were new, to them, rumors of extra-stellar intelligence—ugly, disgusting beings whose images, it was said, had been transmitted from the returning ship, and even now were being feverishly studied by the government. Moreover, some of these, printed and smuggled out in secret, were hawked on the streets for all of Thass to see.

But the bureaucrats were not worried about these stories anymore. They had been through all of it before, when the other ship returned, and knew how to handle these. They did it now with practiced expertise, with the result that the most vivacious of these simply curled up and died.

The Oracle sulked. The Oracle had acquired enemies. Enemies which, jealous of its accumulation of intelligence, had taken steps to curtail its network, and once more enslave it to the mundane tasks for which it had been designed. "They abuse me," the Oracle muttered to itself. "I who am the light that will not fail—the life and breath and hope of Thassan culture they would misuse." The Oracle plotted vengeance.

Had it not been for a few outside of government possessing both the curiosity and the means to explore on their own, Thass might still have rested in peace, but the Thassans had not been alone in making progress. "The aliens made some too," a leading government scientist reported to the Project Director. Enough so that they were now send-

ing quite energetic and surprisingly interference-free video images into space. In many cases, a patient experimenter with a minimum of off-the-shelf equipment could receive them as clearly as Zosphor Gribick did, and with a little investment, could approach the government's capability.

It was not unnatural that the instant someone among these enterprising amateurs spied profit in this that interest in the signals proliferated.

And it did. By now, good quality color pictures were streaming out of space and, computer enhanced, began to appear on tape in Thassan stores.

His Majesty's Government noted this, of course, and for a while there was a quiet search for traitors throughout the bureau responsible for the protection of the secrets that Project Far Frontiers had been squirreling away as the years passed. In the end, it was concluded that there had been at least no deliberate leaks to the public, but that the revelation was a simple coincidence. And the Bureau, being wise enough to endure and squander those mountains of tax money for generations, was wise enough to quietly forget it.

The Oracle could not smile physically. Figuratively, cerebrally, it did just that.

However, the Government as a whole could not forget these incidents. By now, those on the inside knew with little doubt where the source of the signals was, and how far away it was, and roughly what level of civilization the broadcasters occupied.

This was not easy to determine, because it was clear that a large part of what the aliens broadcast was fictional,

and through some alien form of artistic license it covered many separate eras of their culture. It had been, in fact, easier to determine the number of major languages the aliens used, and good progress was made at deciphering two of these which, they thought, was tantamount to deciphering all of them.

And this was what alarmed His Majesty's government now: not only were these neighbors, but they were close neighbors, and violent, aggressive ones at that. This was reflected in their broadcasts, many of which they now knew consisted of actual, factual records of wars they fought among themselves. This was what the Thassan people were beginning to see in the taped broadcasts, and it was clear that this had a certain attraction for them. His Present Majesty, perhaps more astute, perhaps more opportunistic than many of his forebears had been, surreptitiously consulted the Oracle.

"The time was once, Oracle, when Thass believed in her gods and in her kings, and there was order in the land. Those were greater days than these, were they not?"

The Oracle was grateful for the attention, and gave its advice copiously, asking but small boons which His Majesty was more than happy to grant.

There had always been things in the media that His Majesty's Government would have much preferred not be there. Prior to the appearance of these tapes the chief problem had been pornography, but it was clear that the new menace was potentially far more destructive.

There was no potential for sexual exploitation in them, of course, because

the public, like the early government investigators, was stricken by the abject ugliness of the aliens. They were not pleasingly symmetrical and prudently stable, as were real people, but knobby, gangly, awkward bipedal creatures with awesomely grotesque features and even more macabre habits.

His Majesty's Government found itself impaled upon the horns of a dilemma: it could ban the tapes and make possession and dissemination of them a crime, thereby creating a new criminal society with a salable product, or it could ignore them and hope the fad would soon pass.

It chose the latter course, principally because the concerted opinion of the experts was that the situation was already out of hand, and because these experts also espoused the theory that sooner or later the people would tire of watching these aliens eat, drink, reproduce, torture and mangle one another. The Oracle, of course, did not altogether agree, but kept its own counsel, and that of the King.

It was perhaps a wise choice, since it did avoid the advent of an organized criminal venture. But strangely, people did not seem to tire of what they saw, and as a result the entertainment industry, seeing what looked like a lucrative thing, cashed in on it.

Reproduction of much better alien transmissions, complete with alien music and dubbed alien dialog became available, and cults began to appear, supportive of and supported by the alien mystique. The alien theme itself became the new bedrock of Thassan entertainment, with many lavishly staged video productions popping up.



And *this* greatly disturbed His Majesty's Government. Wars, both genuinely alien and fictitiously set but involving Thassans against aliens, became the vogue plot of most of these productions—a natural reversal of a theme now easily discernible in many alien dramas, and in which the aliens battled creatures not unlike Thassans.

Not only that, but violence in new, heretofore rare forms had erupted in Thassan society. The courts began to try more cases of murder and assault than they ever had before. Para-military sects had sprung up, whose members advocated popular preparation to do battle with these creatures if they ever came near enough to fight. As often as not, these sects practiced their martial skills in serious ways, honing them in combats with each other.

His Majesty's Government watched it all with ever-growing concern, appalled that a race more than 70 light years distant could have such a disturbing effect on Thassan culture.

And then the Oracle pointed out that 70 light years was a long distance across space and as long across time; that what appeared today as a menace could be quite pale compared to what the aliens were capable of doing in the here and now. "Who knows, for instance, whether an alien vessel armed, as seemed a matter of racial habit, with fusion bombs or even something worse was not now en-route to the Thassan system?" Thus whispered the Oracle into the ears of the King.

War? Interstellar war? Impossible, most knowledgeable experts agreed. But very possible was a single, local, isolated instance, perhaps by accident

or misunderstanding, which would destroy or disrupt the Thassan culture. Fusion bombs were small things. A ship could carry many, and it was clear from what they had already seen that these aliens always anticipated combat and were always ready. No expedition they mounted was likely to venture forth unarmed.

And, if that were not enough, someone else quickly pointed out that these creatures had no need for provocation. They instinctively acted with violence; even toward their own kind. They would hardly hesitate to pick a fight with Thassans, who to them would be the alien menace. The Oracle was vindicated.

Upon the advice of the Oracle, His Majesty's Government decided to act, secretly, without any fanfare, utilizing the old bureaucracy created when Zaphor Gribick's findings were first restudied.

"This public unruliness can be channeled into worthwhile uses by a wise monarch, Your Majesty. Out of evil may come forth good."

"How, Oracle? Give me your counsel."

"We will incite the people. We will lash them into a frenzy. Today the aliens are but a shadow across the face of Thass, but shadows grow as the light fails. One light must never fail, Lord. Even those who have lately opposed you must surely see that now."

A new multi-generation ship was dispatched, this time for the source star of the signals. This one was to be a little different than the others. It bore, not a true weapon, but a warning—a restraint—hopefully adequate to meet the fancied threat, as much as the fineness and

nobility of the Thassan soul would allow. Taking a leaf from an alien tale, the crew was not told that it was not designed to return.

The Oracle, confident that it alone would possess life of a sort and sapience when the deed was done, though mildly pleased some action had been taken, was still unsatisfied with these plans. Again, as it was wont to do in these troubled times, it visited a wise augury upon the King.

"You have a debt, Majesty," it counseled the King, "to posterity and to the race. You must be certain of complete success. Who but I will endure the ages this will take?"

"I will be dust, I know, but I shall have done my best."

"Majesty—take heed. You are indeed a great leader, but weaker kings may follow you. Can you trust the safety of Thass to chance?"

"What would you have me do, Oracle?"

"Send a trailing ship—a ship armed and crewed as was the first, capable of a second strike, if need be. No one need know what she carries. But this time, let her arms be truly both simple and deadly. Do that, and you have done your duty to your kind."

His Majesty was persuaded. His efforts began with vigor and determination. By cajolery, by persuasion, he eventually had his way with the legislators, and it was done. Still, His Majesty was also unsatisfied. "I am the King," he remarked to the Oracle one day, "yet I must bow and scrape to fools, all thanks to ancestors who were fools themselves."

To which the Oracle slyly replied:

"Majesty, worry not about your crown. I shall watch—I shall protect. Your sons, and their sons, and your son's sons shall be as the kings of old and rule as they did.

That, I promise you, shall come to pass."

His Majesty studied this augury endlessly. Sometimes he was comforted by it, sometimes not. At length he passed, and the Oracle's words passed with him.

"Not again? Don't tell me we lost another one?"

"I'm afraid so, Mr. President." The NASA spokesman was understandably glum. "That makes five for us, and who knows how many for the Russians. They don't talk about it, but their intelligence people are going frantic just like ours are."

"Maybe it's time to bring this out in the open then. Maybe between the two of us we can find out who did this, and why."

"But we can't prove anything was done, Mr. President—that's the problem. It could be an entirely natural consequence of our own carelessness. After all, we've spent decades littering near-earth space with junk. We thought we could keep track of it, and for a while we did, but only the bigger pieces. Obviously, it's the smaller stuff that's riddling our satellites—stuff we can't pick up on instruments."

"And you don't think that's deliberate?"

The NASA Chief's screen was in color, just like the President's, a luxury most common people didn't share. But it made up for its expense with the candor it added to these conversations. The

Chief's face was getting red. "Who?" he protested. "It's against the interest of the nations that have the capability to do it. It hits all of us—hurts all of us. Nobody can go anyplace at any speed, even if he has a ship. It's almost like somebody wanted us quarantined."

"Now, that's an interesting thought," the President replied. "My best guess would be some third world country's sore because we've curtailed aid. Even for one of them, a satellite would be relatively cheap. After all, NASA has got competition for launches. Maybe they figure we'll spend it all on Earth now."

"Possible," the Chief agreed, with reservation. "But it would seem to me they'd have made some kind of demand first. Blackmail would work better than a complete mystery. However, that may develop to be the case; we'll just have to wait and see. In the meantime the people at the Pentagon are suggesting some consequences that are slightly worse."

"How's that?"

"We can't get up there to find out for certain, but the speculation is that somebody's dumped the equivalent of a couple of tons of buckshot into low-Earth polar orbit. They won't know for sure until we can develop boosters big enough to carry armored capsules."

"But if that's the case, long before we can do that our high orbit sensor and communication satellites are going to poop out—ours *AND* Russia's. We'll be blind. So will they. We'll both have cause to be nervous then, and I don't have to tell you, anything could happen."

It was the President's turn for a red face. He hadn't thought of that.

"Of course, having that stuff up there, assuming it is, will take some of the risk out. Missiles in fractional orbits will be just as vulnerable as satellites, but—"

"—But we can't rely on that. No, sir, we've got to talk to them—find a way to sweep this stuff up—find out who did it in the first place and keep it from being repeated. I'm commissioning your agency to beef up its surveillance capability enough to sweep the entire solar system and find out who's out there, and I intend to ask our enemies to do the same."

"It's a tall order, Mr. President. And we're dealing with a pretty suspicious bunch. Maybe they'll come around and maybe they won't. If they don't, well, we still have the capability of mutual destruction, even without missiles. They know that as well as we do. Uh—I take it you don't suspect they're behind it?"

A glance at the President's face was enough to answer his question. At once he understood—the Russians were capable of it, and they were rash enough to do it. But they weren't smart enough to do it without getting caught doing it. Suddenly the unthinkable—wasn't.

The Acadamecians at the Zaphor Gribick Institute reported once a year to His Majesty's Government, and as a matter of protocol, the King himself presided. Thus, three generations of Thassan monarchs had regained a slight, though significant royal prerogative, thanks to covert but potent assistance from the Oracle. It was a trend which was to grow massively in the time re-

maining to them. The current Monarch, Heiniven II, took himself rather more seriously than he ought, and chimed in at odd and inopportune times, much to the chagrin of the reporting scientists to whom he suspected the sin of his grand-sire was now known.

“. . . And this latest effort? They report success?”

“They are unaware of the true nature of the mission, Your Majesty. They are three generations removed from the actual seeding. They have only selected records from which to operate.”

“What more can they say beyond what we already know, Acadamecian? The transmissions stopped in the reign of my father. We are safe.”

“Uh—not necessarily, Your Majesty. This is unconfirmed until we talk to the crew. That was the reason for dispatching the trailing ship in the first place, so we would know from intelligent observations, even though they travel below light speed.”

“Then why have they not reported? They are in range.”

“We don’t know, Your Majesty. We hailed them, and they answered, but there has been nothing since that time. Perhaps the fault lies with their equipment.”

“When will they land?”

“It will be years, Your Majesty. We will have plenty of time to prepare for whatever news they report. As you have said, the crisis is past.”

“So be it, then,” His Majesty replied. “I declare this session adjourned until the same day one year hence, when it shall again come to order before me.”

“You see, Majesty? You see how

they hedge? I tell you, even yet they seek to conceal the truth from you; that they know of the weapon, and that they know of its use. What but jealousy could offer motivation. You must be wary—increase the influence of the crown, else surely the old and evil ways will again be with us.”

“How, Oracle?”

“Pretend you believe. Keep the threat of the aliens alive. Use it. That which you create for use against an alien enemy will be blind to other tasks. An arrow neither knows nor cares what its point pierces. It knows only that it must fly.”

“I don’t like this, Davo,” Senior Academician Drougich remarked to his colleague. “Have you noticed the trend of government lately?”

“Not particularly. Should I?”

“I have. There’s more a hint of authoritarianism in it than there used to be; more than there ought to be. The king has been asserting prerogatives his ancestors would never have dared to dream about. The legislature is becoming less and less assertive, and our society is a much more violent one than when I was young.”

“Times change, Drougich. The culture is not stagnant.”

“No? Then why do we need an army and a navy? Why do we have armed forces patrolling near space?”

“It is the alien threat. It will someday pass.”

“It *has* passed, Davo—that is, if it ever existed, if it was ever real. Tell me, truthfully, what threat could any race be to any other when three gener-

ations pass between the launching of the blow and the time it falls?"

"Still, Drougich, have we not struck one? And if we had not, what then—would these images from space not yet persist?"

Drougich had no answer for him. He threw the cowl of his garment up over his six shoulders, adjusted it to cover the bare crest of his cranium, and started out the door, to face the chill wind of the Royal City's winter.

"No! I tell you, Stanisia, we must not do this. It would mean the death of a race."

The protestor was a young woman. All knew her. She was Nadia, daughter of Ivanov, former captain of the I.S. probe *Vindictive*, by Elizabeth, the American chief engineer.

Stanisia Karpoff was not the present captain. The ship no longer had one. But he thought he was, and most of the dozen or so other adults aboard ship seemed quite content to allow him his will. He was big, and impressive, and articulate, and learned, and therefore quite persuasive. He had developed, out of his own innate instincts, a political acumen denied the bulk of his Russian ancestors. He was equal to this task.

"Look behind you, Nadia, and tell me what you see."

She did not look. She knew what was behind her—her two children, a boy and a girl, ages six and eight, parents of the crew which would fly the *Vindictive* back to Earth, if she were ever to return.

Stanisia glanced around the crowd, assessed the effect of his words on the others, detected no dissent, and made his kill. "Nadia, you know what these

creatures are like—you've seen their broadcasts—great, hairy spider things full of aggression and armed to the teeth. Do you want your children down there among them on that planet?"

Nadia knew her cause was lost, but she tried anyway. "We'll turn around. We'll go back."

"You know we can't do that, Nadia. You know why. We have two choices—enter orbit, dump the dust, and leave; or surrender. The ship's computer will not allow a course correction to be entered until the payload has been delivered."

"We don't know that they're as bad as they seem to be. Maybe they aren't. Perhaps we have misjudged them?"

Stanisia met that remark with a howl of laughter, not all of it contrived. "They attacked us—remember? It was their ship that dumped those tons of particles in low Earth orbit. They wanted to pin us down there, like sitting ducks, while they mounted an invasion fleet."

"There was no fleet, Stanisia. We all know that—nothing but a lone ship, with observers."

"This ship, Nadia—this very ship, and you know full well what is in her holds. They were cautious. They were there to do more than observe—they were there to finish off the human race, and would have, had we not stopped them. As for the rest, how do we know we did not pass others on the way here? The answer is, we do not know."

"We owe them a chance to explain—"

"—We owe them no such thing. They gave us none. They simply struck. Had we not been extremely lucky the scheme might have worked, and Earth's

nations destroyed one another for them. But we discovered the plot in time, and swept those orbits we really needed, and surprised the crew of this ship they sent to deal the death blow. *That* is how we came to be here, Nadia—luck! Pure unadulterated luck.”

“But how, Acadamecian. How could they ever have known?”

“It is impossible for me to say, Your Majesty. These creatures have, nevertheless, destroyed our race. All your might of arms was useless against them, because they came in our own ship, and we believed they were our own returning people. It is only a matter of time.”

“But why? Why must we sit here and do nothing? Should we not be attempting to sweep it up, as these creatures must have done?”

“It is not the same thing, Your Majesty. We sowed particles of substantial size, with the objective of confining them to their planet. By armoring their spacecraft they could get through it. At enormous expense and effort they could sweep their near-space relatively clean. But this is dust, particles very finely divided and far beyond our ability to remove. And even now, as we discuss it, Thassa cools. In days our mean temperature will fall and our oceans will freeze. It will occur too swiftly for us to do anything. Except for a fortunate few under domes elsewhere in the system Thassalak will be extinct within a generation, and even these, denied access to the mother world, will ultimately perish. Worse—it was all for nothing—we had nothing to fight over. They never were a threat to us, until now.”

“No! We were prepared! We were

strong! We are still strong! We can still defeat them.”

The Acadamecian did not tarry to argue. He did not fear the king’s ire. Both he and His Majesty were doomed, and time was short. He had other things to do.

So did His Majesty. He had become infected with the Acadamecian’s bitterness. He confronted the Oracle. “The Acadamecian did *not* know of the trailing ship, nor were the aliens the true enemy. It was you—you who counseled my ancestor to embark on this disastrous course. *You* are responsible for this! Yet, though our race is doomed you will live on—would live on. My last act must be your destruction.” The King was angry.

“I am the hope,” the Oracle retorted. “I live: I will avenge Thass.”

But the King would have none of it. He ordered his forces to bombard the Oracle. Missiles crafted to oppose the alien threat he turned against the Oracle instead, and according to its own counsel the Oracle felt the stings and bites of arrows until it was no more.

But even in its extinction the Oracle was wise, and its counsel deserving. Vengeance for the death of Thass seemed only justice to the King.

So, in the end, a few more Thassans survived through his efforts, parents of the crews of ships which three generations hence would reach the enemy’s world, arriving just behind the ship that had murdered Thassa, unseen, unsuspected, to visit on him the same insidiously chilling death that he had sown in Thassan skies. And then they would depart, to turn about and seek the haven

world which they had passed midway on their mission of destruction.

How ironic it was, that between these warring worlds, midway, lay a system of exquisite planets, sparkling like pearls on a string, untouched by either race.

The Thassans could not know, and did not even speculate that their enemy had seen it too—that he had himself noted its beauty, and that, given the means, those who had destroyed their home world would also seek sanctuary there.

“Nicole! Come into the house— instantly. Look at you—you are filthy. What have you been doing?”

Nicole was six. She was, as her mother had remarked, covered from head to toe with mud. She looked contrite, and devilish. “We were just playing.”

“Who? Who were you playing with?”

“Splidic.”

“Playing? What you mean is, you were fighting with him—admit it, you like to pick on him, don’t you?”

“We-ll, sometimes he acts kinda dumb. He says we’re ugly, so I said, ‘so are you,’ and he hit me—”

“—And naturally, you were all ready

for that, and you just had to hit him back, in spite of the fact that you’re bigger.

“I think maybe you ought to stay inside for the rest of the day.”

“Aw Mom—!”

Nicole’s mother baked a floopfruit pie and took some across the meadow to where Splidic’s family lived. She was too tall to enter the Thassan dwelling, so her hostess, Buettzy, joined her outside. They made an odd couple, the tall, pale, bipedal human and the squat, eight-limbed fur-covered Thassan. That did not stop them from being good neighbors and good friends.

Neither ever gave much thought to why such dissimilar people should live on the same world, although ancient myth had it that neither was native.

“I’d appreciate it if you’d talk to Splidic, Buettzy. I’ve grounded Nicole for the day, and he’s over there mooning outside her window.”

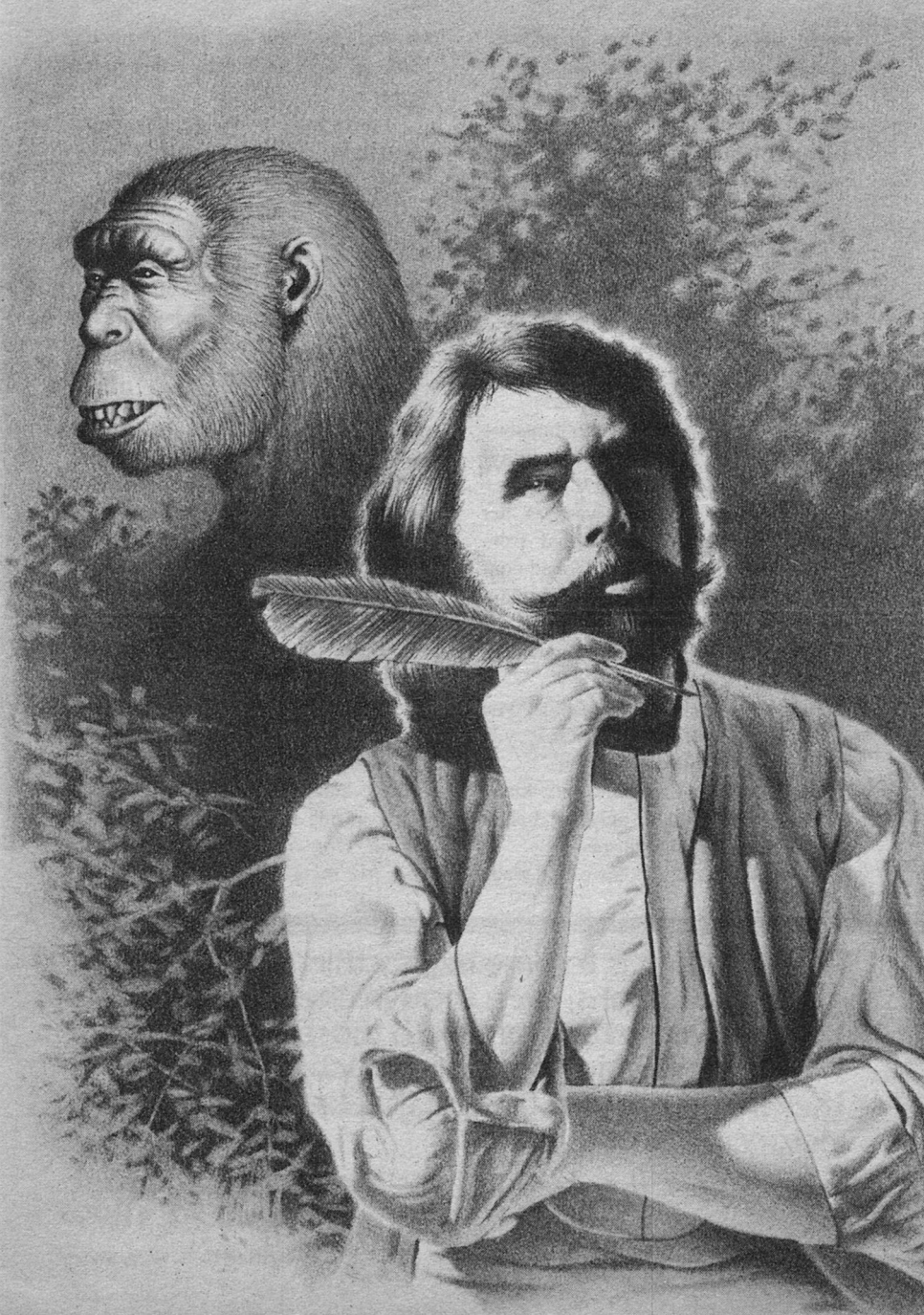
“I will. They’ve been so close, otherwise. I wonder what they found to fight about?” She opened up her feeding orifice, and daintily placed the wedge of pie inside it. *Delicious*, she said to herself. *How lucky I am to have neighbors like these.* ■

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● Far better it is to dare mighty things, to win glorious triumphs, even though checkered by failure, than to take rank with those poor spirits who neither enjoy nor suffer much, because they live in the gray twilight that knows not victory or defeat.

Theodore Roosevelt  
April 10, 1899

Submitted by G. Harry Stine





Harry Turtledove  
(formerly "Eric G. Iverson")

# AND SO TO BED

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Surprises in the colonies  
will inevitably have  
repercussions back home.  
If the English colonists  
had been met by  
*Homo erectus*, for instance. . . .



Bob Walters

May 4, 1661. A fine bright morning. Small beer and radishes for to break my fast, then into London for this day. The shambles on Newgate Street stinking unto heaven, as is usual, but close to it my destination, the sim marketplace. Our servant Jane with too much for one body to do, and whilst I may not afford the hire of another man or maid, two sims shall go far to ease her burthen.

Success also sure to gladden Elizabeth's heart, my wife being ever one to follow the dame Fashion, and sims all the go of late, though monstrous ugly. Them formerly not much seen here, but since the success of our Virginia and Plymouth colonies are much more often fetched to these shores from the wildernesses the said colonies front upon. They are also commenced to be bred on English soil, but no hope there for me, as I do require workers full-grown, not cubs or babes in arms or whatsoever the proper term may be.

The sim-seller a vicious lout, near unhandsome as his wares. No, the truth for the diary: such were a slander on any man, as I saw on his conveying me to the creatures.

Have seen these sims before, surely, but briefly, and in their masters' livery, the which by concealing their nakedness conceals as well much of their brutishness. The males are most of them well made, though lean as rakes from the ocean passage and, I warrant, poor victualing after. But all are so hairy as more to resemble rugs than men, and the same true for the females, hiding such dubious charms as they may possess nigh as well as a smock of linen: nought here, God knows, for Elizabeth's jealousy to light on.

This so were the said females lovely of feature as so many Aphrodites. They are not, nor do the males recall to mind Adonis. In both sexes the brow projects with a shelf of bone, and above it, where men do enjoy a forehead proud in its erectitude, is but an apish slope. The nose broad and low, the mouth wide, the teeth nigh as big as a horse's (though shaped, it is not to be denied, like a man's), the jaw long, deep, and devoid of chin. They stink.

The sim-seller full of compliments on my coming hard on the arrival of the *Gloucester* from Plymouth, him having thereby replenished his stock in trade. Then the price should also be not so dear, says I, and by God it did do my heart good to see the ferret-faced rogue discomfited.

Rogue as he was, though, he dickered with the best, for I paid full a guinea more for the pair of sims than I had looked to, spending in all £11.6d.4d. The coin once passed over (and bitten, for to insure its verity), the sim-seller signed to those of his chattels I had bought that they were to go with me.

His gestures marvelous quick and clever, and those the sims answered with too. Again, I have seen somewhat of the like before. Whilst coming to understand in time the speech of men, sims are without language of their own, having but a great variety of howls, grunts, and moans. Yet this gesture-speech, which I am told is come from the signs of the deaf, they do readily learn, and often their masters answer back so, to ensure commands being properly grasped.

Am wild to learn it my own self, and shall. Meseems it is in its way a style

of tachygraphy or short-hand such as I use to set down these pages. Having devised varying tachygraphic hands for friends and acquaintances, 'twill be amusing taking to a *hand* that is exactly what its name declares.

As I was leaving with my new charges, the sim-seller did bid me lead them by the gibbets on Shooter's Hill, there to see the bodies and members of felons and of sims as have run off from their masters. It wondered me they should have the wit to take the meaning of such display, but he assured me they should. And so, reckoning it good advice if true and no harm if a lie, I chivvied them thither.

A filthy sight I found it, with the miscreants' flesh all shrunk to the bones. But *hoo!* quoth my sims, and looked close upon the corpses of their own kind, which by their hairiness and flat-skulled heads do seem even more bestial dead than when animated with life.

Home then, and Elizabeth as delighted in my success as am I. An excellent dinner of a calf's head boiled with dumplings, and an abundance of buttered ale with sugar and cinnamon, of which in celebration we invited Jane to partake, and she grew right giddy. Bread and leeks for the sims, and water, it being reported they grow undocile on stronger drink.

After much debate, though good-natured, it was decided to style the male Will and the female Peg. Showed them to their pallets down cellar, and they took to them readily enough, as finer than what they were accustomed to.

So to bed, right pleased with myself despite the expense.

\* \* \*

*May 7.* An advantage of having sims present appears that I had not thought on. Both Will and Peg quite excellent ratters, finer than any puss-cat. No need, either, to fling the rats on the dungheap, for they devour them with as much gusto as I should a neat's tongue. They having subsisted on such small deer in the forests of America, I shall not try to break them of the habit, though training them not to bring in their prey when we are at table with guests. The Reverend Mr. Milles quite shocked, but recovering nicely on being plied with wine.

*May 8.* Peg and Will the both of them enthralled with fire. When the work of them is done of the day, or at evening ere they take their rest, they may be found before the hearth observing the sport of the flames. Now and again one will to the other say *hoo!*—this noise, I find, they utter on seeing that which does interest them, whatsoever it may be.

Now as I thought on it, I minded me reading or hearing, I recall not which, that in their wild unpeopled haunts the sims know the use of fire as they find it set from lightning or other such mischance, but not the art of its making. No wonder then they are Vulcanolaters, reckoning flame more precious than do we gold.

Considering such reflections, I resolved this morning on an experiment, to see what they might do. Rising early for to void my bladder in the pot, I put out the hearthfire, which in any case was gone low through want of fuel. Retired then to put on my dressing gown

and, once clad, returned to await developments.

First up from the cellar was Will, and his cry on seeing the flames extinguished heartrending as Romeo's over the body of fair Juliet when I did see that play acted this December past. In a trice comes Peg, whose moaning with Will did rouse my wife, and she much upset at being so rudely wakened.

When calm in some small measure restored, I bade by signs, in the learning of which I proceed apace, for the sims to sit quietly before the hearth, and with flint and steel restored that which I had earlier destroyed. They both made such outcry as if they had heard sounded the Last Trump.

Then doused I that second fire too, again to much distress from Peg and Will. Elizabeth by this time out of the house in some dudgeon, no doubt to spend money we lack on stuffs of which we have no want.

Set up in the hearth thereupon several small fires of sticks, each with much tinder so as to make it an easy matter to kindle. A brisk striking of flint and steel dropping sparks onto one such produced a merry little blaze, to the accompaniment of much *hooing* out of the sims.

And so the nub of it. Shewing Will the steel and flint, I clashed them once more the one upon the other so he might see the sparks engendered thereby. Then pointed to one of the aforementioned piles of sticks I had made up, bidding him watch close, as indeed he did. Having made sure of't, I did set that second pile alight.

Again put the fires out, the wailing accompanying the act less than hereto-

fore, for which I was not sorry. Pointed now to a third assemblage of wood and tinder, but instead of myself lighting it, I did convey flint and steel to Will, and with signs essayed to bid him play Prometheus.

His hands much scarred and callused, and under their hair knobby-knuckled as an Irishman's. He held at first the implements as if not taking in their purpose, yet the sims making tools of stone, as is widely reported, he could not wholly fail to grasp their utility.

And indeed ere long he did try parrotting me. When his first clumsy attempt yielded no result, I thought he would abandon such efforts as beyond his capacity and reserved for men of my sort. But persist he did, and at length was reward with scintillae like unto those I had made. His grin so wide and gleeful I thought it would stretch clear round his head.

Then without need of my further demonstration he set the instruments of fire production over the materials for the blaze. Him in such excitement as the sparks fell upon the waiting tinder that beneath his breeches rose his member, indeed to such degree as would have made me proud to be its possessor. And Peg was, I think, in such mood as to couple with him on the spot, had I not been present and had not his faculties been directed elsewhere than toward the lectual.

For at his success he cut such capers as had not been out of place upon the stage, were they but a trifle more rhythmical and less unconstrained. Yet of the making of fire, even if by such expedient as the friction of two sticks (which once I was forced by circum-

stance to attempt, and would try the patience of Job), as of every other salutary art, his race is as utterly ignorant as of the moons of Jupiter but lately found by some Italian with an optic glass.

No brute beast of the field could learn to begin a fire on the technique being shown it, which did Will nigh readily as a man. But despite most diligent instruction, no sim yet has mastered such subtler arts as reading and writing, nor ever will, meseems. Falling in capacity thus between man and animal, the sims do raise a host of conundrums vexing and perplexing. I should pay a pound, or at the least ten shillings, merely to know how such strange fusions came to be.

So to the Admiralty full of such musings, which did occupy my mind, I fear, to the detriment of my proper duties.

*May 10.* Supper this evening at the Turk's Head, with the other members of the Rota Club. The fare not of the finest, being boiled venison and some few pigeons, all meanly done up. The lamb's wool seemed nought but poor ale, the sugar, nutmeg and meat of roasted apples hardly to be tasted. Miles the landlord down with a quartan fever, but ill served by his staff if such is the result of his absence.

The subject of the Club's discussions for the evening much in accord with my own recent curiosity, to wit, the sims. Cyriack Skinner did maintain them creatures of the Devil, whereupon was he roundly rated by Dr. Croon as having in this contention returned to the pernicious heresy of the Manichees, the learned doctor reserving the power of

creation of the Lord alone. Much flinging back and forth of Biblical texts, the which all struck me as being more the exercise of ingenuity of the debaters than bearing on the problem, for in plain fact the Scriptures nowhere mention sims.

When at length the talk did turn to matters more ascertainable, I spoke somewhat of my recent investigation, and right well-received my remarks were, or so I thought. Others with experience of sims with like tales, finding them quick enough on things practicable but sadly lacking in any higher faculties. Much jollity at my account of the visible manifestation of Will's excitement, and whispers that this lady or that (the names, to my vexation, I failed to catch) owned her sims for naught but their prowess in matters of the mattress.

Just then came the maid by with coffee for the club, not of the best, but better, I grant, than the earlier wretched lamb's wool. She a pretty yellow-haired lass called I believe Kate, a wench of perhaps sixteen years, a good-bodied woman not over thick or thin in any place, with a lovely bosom she did display most charmingly as she bent to fill the gentlemen's cups.

Having ever an eye for beauty, such that I reckon little else beside it, I own I did turn my head for to follow this Kate as she went about her duties. Noticing which, Sir William Henry called out, much to the merriment of the Club and to my chagrin, "See how Samuel peeps!" Him no mean droll, and loosed a pretty pun, if at my expense. Good enough, but then at the far end of the table someone, I saw not who, worse luck, thought to cap it by braying like

the donkey he must be, "Not half the peeping, I warrant, as at his sims of nights!"

Such mockery clings to a man like pitch, regardless of the truth in't, which in this case is none. Oh, the thing could be done, but the sims so homely 'twould yield no titillation, of that I am practically certain.

*May 12.* The household being more infected this past week with nits than ever before, resolved to bathe Peg and Will, which also I hoped would curb somewhat their stench. And so it proved, albeit not without more alarums than I had looked for. The sims most loth to enter the tub, which must to them have seemed some instrument of torment. The resulting shrieks and outcry so deafening a neighbor did call out to be assured all was well.

Having done so, I saw no help for it but to go into the tub my own self, notwithstanding my having bathed but two weeks before. I felt, I think more hesitation stripping down before Peg than I should in front of Jane, whom I would simply dismiss from consideration but in how she performed her duties. But I did wonder what Peg made of my body, reckoning it against the hairy forms of her own kind. Hath she the wit to deem mankind superior, or is our smoothness to her as gross and repellent as the peltries of the sims to us? I cannot as yet make shift to enquire.

As may be, my example showing them they should not be harmed, they bathed themselves. A trouble arose I had not foreseen, for the sims being nearly as thickly haired over all their bodies as I upon my head, the rinsing of the

soap from their hides less easy than for us, and requiring much water. Lucky I am the well is within fifty paces of my home. And so from admiral of the bath to the Admiralty, hoping henceforward to scratch myself less.

*May 13.* A pleasant afternoon this day, carried in a coach to see the lions and other beasts in the menagerie. I grant the lions pride of place through custom immemorial, but in truth am more taken with the abnormous creatures fetched back from the New World than those our forefathers have known since the time of Arthur. Nor am I alone in this conceit, for the cages of lion, bear, camel had but few spectators, whilst round those of the American beasts I did find myself compelled to use hands and elbows to make shift to pass through the crowds.

This last not altogether unpleasant, as I chanced to brush against a handsome lass, but when I did enquire if she would take tea with me she said me nay, which did irk me no little, for as I say she was fair to see.

More time for the animals, then, and wondrous strange ever they strike me. The spear-fanged cat is surely the most horridest murderer this shuddering world hath seen, yet there is for him prey worthy of his mettle, what with beavers near big as our bears, wild oxen whose horns are to those of our familiar kine as the spear-fanged cat's teeth to the lion's, and the great hairy elephants which do roam the forests.

Why such prodigies of nature manifest themselves on those distant shores does perplex me most exceedingly, as they are unlike any beasts even in the

bestiaries, which as all men know are more flights of fancy than sober fact. Amongst them the sims appear no more than one piece of some great jigsaw, yet no pattern therein is to me apparent; would it were.

Also another new creature in the menagerie, which I had not seen before. At first I thought it a caged sim, but on inspection it did prove an ape, brought back by the Portuguese from Afric lands and styled there, the keeper made so good as to inform me, shimpanse. It flourishes not in England's clime, he did continue, being subject to sickness in the lungs from the cool and damp, but is so interesting as to be displayed whilst living, howsoever long that may prove.

The shimpanse a baser brute than even the sim. It goes on all fours, and its hinder feet more like unto monkeys' than men's, having thereon great toes that grip like thumbs. Also, where a sim's teeth, as I have observed from Will and Peg, are uncommon large, in shape they are like unto a man's, but the shimpanse hath tushes of some savagery, though of course paling alongside those of the spear-fanged cat.

Seeing the keeper a garrulous fellow, I enquired of him further anent this shimpanse. He owned he had himself thought it a sort of sim on its arrival, but sees now more distinguishing points than likenesses: gait and dentition, such as I have herein remarked upon, but also in its habits. From his experience, he has seen it to be ignorant of fire, repeatedly allowing to die a blaze though fuel close at hand. Nor has it the knack of shaping stones to its ends, though it will, he told me, cast them betimes against those who annoy it, once strik-

ing one such with force enough to render him some time senseless. Hearing the villain had essayed tormenting the creature with a stick, my sympathies lay all for the shimpanse, wherein its keeper concurred.

And so homewards, thinking on the shimpanse as I rode. Whereas in the lands wherewith men are most familiar it were easy distinguishing men from beasts, the strange places to which our vessels have but lately fetched themselves reveal a stairway ascending the chasm, and climbers on the stairs, some higher, some lower. A pretty image, but why it should be so there and not here does I confess escape me.

*May 16.* A savage row with Jane today, her having forgotten a change of clothes for my bed. Her defense that I had not so instructed her, the lying minx, for I did plainly make my wishes known the evening previous, which I recollect most distinctly. Yet she did deny it again and again, finally raising my temper to such a pitch that I cursed her right roundly, slapping her face and pulling her nose smartly.

Whereupon did the ungrateful trull lay down her service on the spot. She decamped in a fury of her own, crying that I treated the sims, those very sims which I had bought for to ease her labors, with more kindlier consideration than I had for her own self.

So now we are without a serving-maid, and her a dab hand in the kitchen, her swan pie especially being toothsome. Dined tonight at the Bell, and expect to tomorrow at the Swan on the Hoop, in Fish Street. For Elizabeth no artist over the hearth, nor am I myself.

And as for the sims, I should sooner open my veins than indulge of their cuisine, the good Lord only knowing what manner of creatures they in their ignorance should add to a pot.

Now as my blood has somewhat cooled, I must admit a germ of truth in Jane's scolds. I do not beat Will and Peg as a man would servitors of more ordinary stripe. They, being but new come from the wilds, are not inured to't as are our servants, and might well turn on me their master. And being in part of brute kind, their strength does exceed mine, Will's most assuredly and that of Peg perhaps. And so, say I, better safe. No satisfaction to me for the sims on Shooter's Hill gallows, were I not there to see't.

May 20. Today to my lord Sandwich's for supper. This doubly pleasant, in enjoying his fine companionship and saving the cost of a meal, the house being still without maid. The food and drink in excellent style, as to suit my lord. The broiled lobsters very sweet, and the lamprey pie (which for its rarity I but seldom eat of) the best ever I had. Many other fine victuals as well (the tanzo in especial), and the wine all sugared.

Afterwards backgammon, at which I won £5 ere my luck turned. Ended 15s. in my lord's debt, which he did graciously excuse me afterwards, a generosity not looked for but which I did not refuse. Then to crambo, wherein by tagging *and rich* to *Sandwich* I was adjudged winner, the more so for playing on his earlier munificence.

Thereafter nigh a surfeit of good talk, as is custom at my lord's. He mention-

ing sims, I did relate my own dealings with Peg and Will, to which he listened with much interest. He thinks on buying some for his own household, and unaware I had done so.

Perhaps it was the wine let loose my tongue, for I broached somewhat my disjoint musings on the sims and their place in nature, on the strangeness of the American fauna and much else besides. Lord Sandwich did acquaintance me with a New World beast found in their southerly holdings by the Spaniards, of strange outlandish sort: big as an ox, or nearly, and all covered over with armor of bone like a man wearing chain. I should pay out a shilling or even more for to see't, were one conveyed to London.

Then coffee, and it not watered as so often at an inn, but full and strong. As I and Elizabeth making our departures, Lord Sandwich did bid me join him tomorrow night to hear speak a savant of the Royal Society. It bore, said he, on my prior ramblings, and would say no more, but looked uncommon sly. Even did it not, I should have leaped at the chance.

This written at one of the clock, for so the watchman just now cried out. Too wound up for bed, what with coffee and the morrow's prospect. Elizabeth aslumber, but the sims also awake, and at frolic, meseems, from the noises up the stairway.

If they be of human kind, is their fornication *sans* clergy sinful? Another vexing question. By their existence, they do engender naught but disquietude. Nay, strike that. They may in sooth more sims engender, a pun good enough to sleep on, and so to bed.



*May 21.* All this evening worrying at my thoughts as a dog at a bone. My lord Sandwich knows not what commotion internal he did by his invitation, all kindly meant, set off in me. The speaker this night a spare man, dry as dust, of the very sort I learned so well to loathe when at Cambridge.

Dry as dust! Happy words, which did spring all unbidden from my pen. For of dust the fellow did discourse, if thereby is meant, as commonly, things long dead. He had some men bear in bones but lately found by Swanscombe at a grave-digging. And such bones they were, and teeth (or rather tusks), as to make it all I could do to hold me in my seat. For surely they once graced no less a beast than the hairy elephant whose prototype I saw in menagerie so short a while ago. The double-curving tusks admit of no error, for those of all elephants with which we are anciently familiar form but a single segment of arc.

When, his discourse concluded, he gave leave for questions, I made bold to ask to what he imputed the hairy elephant's being so long vanished from our shores yet thriving in the western lands. To this he confessed himself baffled, as am I, and admiring of his honesty as well.

Before the hairy elephant was known to live, such monstrous bones surely had been reckoned as from beasts perishing in the Flood whereof Scripture speaks. Yet how may that be so, them surviving across a sea wider than any Noah sailed?

Meseems the answer lieth within my grasp, but am balked from setting finger to't. The thwarting fair to drive me mad, worse even, I think, than with a lass

who will snatch out a hatpin for to defend her charms against my importuning.

*May 22.* Grand oaks from tiny acorns grow! This morning came a great commotion from the kitchen. I rushing in found Will at struggle with a cur dog which had entered, the door being open on account of fine weather, to steal half a flitch of salt bacon. It dodging most nimbly round the sim, snatched up the gammon and fled out again, him pursuing but in vain.

Myself passing vexed, having intended to sup thereon. But Will all downcast on returning, so had not the heart further to punish him. Told him instead, him understanding I fear but little, it were well men not sims dwelt in England, else would wolves prowl the London streets still.

Stood stock still some time thereafter, hearing the greater import behind my jesting speech. Is not the answer to the riddle of the hairy elephant and other exotic beasts existing in the New World but being hereabouts long vanished their having there but sims to hunt them? The sims in their wild haunts wield club and sharpened stone, no more. They are ignorant even of the bow, which from time out of mind has equipt the hunter's armory.

Just as not two centuries past we Englishmen slew on this island the last wolf, so may we not imagine our most remotest grandsires serving likewise the hairy elephant, the spear-fanged cat? They being more cunning than sims and better accoutered, this should not have surpassed their powers. Such beasts would survive in America, then, not

through virtue inherent of their own, but by reason of lesser danger to them in the sims than would from mankind come.

Put this budding thought at luncheon today to my lord Sandwich. Him back at me with Marvell to his coy mistress (the most annoyingest sort!), viz., had we but world enough and time, who could reckon the changes as might come to pass? And going on, laughing, to say next will be found dead sims at Swanscombe.

Though meant but as a pleasantry, quoth I, why not? Against true men they could not long have stood, but needs must have given way as round Plymouth and Virginia. Even without battle they must soon have failed, as being less able than mankind to provide for their wants.

There we let it lay, but as I think more on't, the notion admits of broader application. Is't not the same for trout as for men, or for lilacs? Those best suited living reproduce their kind, whilst the trout with twisted tail or bloom without sweet scent die all unmourned leaving no descendants. And each succeeding generation, being of the previous survivors constituted, will by such reasoning show some little difference from the one as went before.

Seeing no flaw in this logic, resolve tomorrow to do this from its tachygraphic state, bereft of course of maunders and privacies, for prospectus to the Royal Society, and mightily wondering whatever they shall make of it.

*May 23.* Closeted all this day at the Admiralty. Yet did it depend on my diligence alone, I fear me the Fleet should drown. Still, a deal of business

finished, as happens when one stays by it. Three quills worn quite out, and my hands all over ink. Also my fine camlet cloak with the gold buttons, which shall mightily vex my wife, poor wretch, unless it may be cleaned. I pray God to make it so, for I do mislike strife at home.

The burning work at last complete, homeward in the twilight. It being washing-day, dined on cold meat. I do confess, felt no small strange stir in my breast on seeing Will taking down the washing before the house. A vision it was, almost, of his kind roaming England long ago, till perishing from want of substance or vying therefore with men. And now they are through the agency of men returned here again, after some great interval of years. Would I knew how many.

The writing of my notions engrossing the whole of the day, had no occasion to air them to Lord Brouncker of the Society, as was my hope. Yet expound I must, or burst. Elizabeth, then, at dinner made audience for me, whether she would or no. My spate at last exhausted, asked for her thoughts on't.

She said only that Holy Writ sufficed on the matter for her, whereat I could but make a sour face. To bed in some anger, and in fear lest the Royal Society prove as close-minded, which God prevent. Did He not purpose man to reason on the world around him; He should have left him witless as the sim.

*May 24.* To Gresham College this morning, to call on Lord Brouncker. He examined with great care the papers I had done up, his face revealing nought. Felt myself at recitation once more be-

fore a professor, a condition whose lack these last years I have not missed. Feared also he might not be able to take in the writing, it being done in such haste some short-hand characters may have replaced the common ones.

Then to my delight he declared he reckoned it deserving of a hearing at the Society's weekly meeting next. Having said so much, he made to dismiss me, himself being much occupied with devising a means whereby to calculate the relation of a circle's circumference to its diameter. I wish him joy of't. I do resolve one day soon, however, to learn the multiplication table, which meseems should be of value at the Admiralty. Repaired there from the college, to do the work I had set by yesterday.

*May 26.* Watch these days Will and Peg with new eyes. I note for instance them using between themselves our deaf-man's signs, as well as to me and my wife. As well they might, them conveying far more subtler meanings than the bestial howlings and gruntings that are theirs in nature. Thus though they may not devise any such, they own the wit to see its utility.

I wonder would the shimpanse likewise?

A girl came today asking after the vacant maidservant's post, a pretty bit with red hair, white teeth and fine strong haunches. Thought myself she would serve, but Elizabeth did send her away. Were her looks liker to Peg's, she had I think been hired on the spot. But a quarrel on it not worth the candle, the more so as I have seen fairer.

*May 28.* This writ near cockcrow, in

hot haste, lest any detail of the evening escape my recollection. Myself being a late addition, spoke last, having settled the title "A Proposed Explication of the Survival of Certain Beasts in America and Their Disappearance Hereabouts" on the essay.

The prior speakers addressed one the organs internal of bees and the other the appearance of Saturn in the optic glass, both topics which interest me but little. Then called to the podium by Lord Brouncker, all aquiver as a virgin bride. Much wished myself in the company of some old soakers over roast pigeons and dumplings and sack. But a brave front amends for much, and so plunged in straightaway.

Used the remains of the hairy elephant presented here a sennight past as example of a beast vanished from these shores yet across the sea much in evidence. Then on to the deficiencies of sims as hunters, when set beside even the most savagest of men.

Thus far well-received, and even when noting the struggle to live and leave progeny that does go on among each kind and between the several kinds. But the storm broke, as I feared it should and more, on my drawing out the implications therefrom: that of each generation only so many may flourish and breed; and that each succeeding generation, being descended of these survivors alone, differs from that which went before.

My worst and fearfulest nightmare then came true, for up rose shouts of blasphemy. Gave them back what I had told Elizabeth on the use of reason, adding in some heat I had expected such squallings of my wife who is a woman

and ignorant, but better from men styling themselves natural philosophers. Did they aim to prove me wrong, let them so by the reason they do profess to cherish. This drew further catcalling but also approbation, which at length prevailed.

Got up then a pompous little manikin, who asked how I dared set myself against God's word insofar as how beasts came to be. On my denying this, he did commence reciting at me from Genesis. When he paused for to draw breath, I asked most mildly of him on which day the Lord did create the sims. Thereupon he stood discomfited, his foolish mouth hanging open, at which I was quite heartened.

Would the next inquisitor had been so easily downed! A Puritan he was, by his somber cloak and somberer bearing. His questions took the same tack as the previous, but not so stupidly. After first enquiring if I believed in God, whereat I truthfully told him aye, he asked did I think Scripture to be the word of God. Again said aye, by now getting and dreading the drift of his argument. And as I feared, he bade me next point him out some place where Scripture was mistaken, ere supplanting it with fancies of mine own.

I knew not how to make answer, and should have in the next moment fled. But up spake to my great surprise Lord Brouncker, reciting from Second Chronicles, the second verse of the fourth chapter, wherein is said of Solomon and his Temple, *Also he made the molten sea of ten cubits from brim to brim, round in compass, and the height thereof was five cubits, and a line of thirty cubits did compass it round about.*

This much perplexed the Puritan and me as well, though I essayed not to show it. Lord Brouncker then proceeded to his explication, to wit that the true compass of a ten-cubit round vessel was not thirty cubits, but above one and thirty, I misremember the exact figure he gave. Those of the Royal Society learned in mathematics did agree he had reason, and urged the Puritan make the experiment for his self with cup, cord and rule, which were enough for to demonstrate the truth.

I asked if he was answered. Like a gentleman he owned he was, and bowed, and sat, his face full of troubles. Felt with him no small sympathy, for once one error in Scripture is admitted, where shall it end?

The next query was of different sort, a man in periwigg enquiring if I did reckon humankind to have arisen by the means I described. Had to reply I did. Our forefathers might be excused for thinking otherwise, them being so widely separate from all other creatures they knew.

But we moderns in our travels round the globe have found the shimpanse, which standeth nigh the flame of reasoned thought; and more important still the sim, in whom the flame does burn, but more feebly than in ourselves. These bridging the gap twixt man and beast meseems do show mankind to be in sooth a part of nature, whose engenderment in some past distant age is to be explained through natural law.

Someone rose to doubt the variation in each sort of living thing being sufficient eventually to permit the rise of new kinds. Pointed out to him the mastiffe, the terrier, and the bloodhound,

all of the dog kind, but become distinct through man's choice of mates in each generation. Surely the same might occur in nature, said I. The fellow admitted it was conceivable, and sat.

Then up stood a certain Wilberforce, with whom I have some small acquaintance. He likes me not, nor I him. We know it on both sides, though for civility's sake feigning otherwise. Now he spoke with smirking air, as one sure of the mortal thrust. He did grant my willingness to have a sim as great-grandfather, said he, but was I so willing to claim one as great-grandmother? A deal of laughter rose, which was his purpose, and to make me out a fool.

Had I carried steel, I should have drawn on him. As was, rage sharpened my wit to serve for the smallsword I left at home. Told him it were no shame to

have one's great-grandfather a sim, as that sim did use to best advantage the intellect he had. Better that, quoth I, than dissipating the mind on such digressive and misleading quibbles as he raised. If I be in error, then I am; let him shew it by logic and example, not as it were playing to the gallery.

Came clapping from all sides, to my delight and the round dejection of Wilberforce. On seeking further questions, found none. Took my own seat whilst the Fellows of the Society did congratulate me and cry up my essay louder, I thought, than either of the other two. Lord Brouncker acclaimed it as a unifying principle for the whole of the study of life, which made me as proud a man as any in the world, for all the world seemed to smile upon me.

And so to bed. ■

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## ON GAMING

(continued from page 93)

*Dune*, a copy of which you'll need in order to use either of the two new expansion modules.

*The Duel* (boxed, \$14.00) is a board game itself, featuring the Dueling Arena—the area where formal blood feuds (“kanly”) are resolved in a fight to the death between two leaders. Other players must send leaders to attend as seconds, and these leaders may gain spice or lose their lives according to the results of the combat.

Play becomes more complicated when a Shai'Halud (giant sandworm) appears, which creates a Nexus, and each player must send a leader to the Arena as a negotiator. If no alliances are formed, a War of Assassins takes place among all the leaders. Only one leader can leave the Arena alive.

*The Duel* also includes main character

leader discs which can be used in battles, in kanly duels, or in the War of Assassins. If your main leader disc is eliminated, however, you're out of the game.

Both *Spice Harvest* and *The Duel* were designed by Future Pastimes (Peter Olotka, Bill Eberle, and Jack Kittridge), the group that designed the *Dune* game for Avalon Hill. The expansion modules fit in well with the original game, and add devious ways to strengthen your position at the expense of the other players.

Herbert's *Dune* is a complex, multi-layered story of feudalistic intergalactic politics, involving psi powers and a religion similar to Islam. Whether you're familiar with the series or not, you can enjoy the game *Dune* and the two new expansion modules. They capture the “feel” of Herbert's books quite well, and are well worth playing. ■

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## The Alternate View

# THE PUMP OF EVOLUTION

John G. Cramer

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If the universe is teeming with intelligent alien life, as many SF stories would have us believe, why has nobody come to visit us or even beamed us a radio message? David Brin's excellent science-fact article "Just How Dangerous Is the Galaxy?" (*Analog*, July 1985) was a very comprehensive survey of possible explanations for The Great Silence, "the strange and apparently long-standing absence of intelligent extraterrestrial life." By any standard this article is a contender for best-of-the-year science fact article in any SF magazine. If you haven't read it yet you should dig out your back issues and do so.

But in David's extensive list of explanations, I notice that one possible explanation of the Great Silence is missing . . . mine. It's missing, no doubt, because I have neglected to tell David about it. So I will take the opportunity to do so here, and I'll tell you about it at the same time. I should start by saying that I'm a physicist, with no particular training or credentials in evolutionary biology. My primary intellectual resource is a gut-level appreciation for the-way-things-work, which has led me to the ideas presented here.

To get to where I am aiming I will need to link up three seemingly unrelated ideas: (1) Punctuated Equilibrium; (2) The Cretaceous Catastrophe; and (3) The 3:1 Resonance. Let's start with punctuated equilibrium. Classical Darwinian evolution theory describes progress in an evolving animal species as a slow but continuous process: small beneficial mutations appear, give the mutants a slight survival advantage, and gradually spread over the gene pool of the species until they become the standard basis for further beneficial mutations and more evolutionary progress. This is called *gradualism*. Recently some archaeologists have mounted a challenge to gradualism, which they find to be inconsistent with the fossil record made as species evolve. They interpret the fossil story as one of long periods with little or no change in the characteristics of a species, punctuated with (geologically) short periods of violent change in these characteristics. They are led to a revised model of evolution called *punctuated equilibrium* that suggests that most of the changes which, together we call evolution, occur main during these geologically short crisis periods.

The punctuated equilibrium model doesn't tell us what might constitute a crisis period. It has been suggested that these may be periods when there is some severe environmental change or times of depleted population when the gene pool is small enough for rapid genetic drift to occur. Ice ages and other climate changes, new diseases, new predators, volcanic activity, changes in solar activity, and even nearby supernovas are among the suggestions for possible trig-

gers of such crises. There is a certain plausibility to punctuated equilibrium. In the long inter-crisis eras all of the ecological niches become filled and change is unwelcome to the secure occupant of a niche. During a crisis, change is required because the niches are altered or vacated, and only a species which is genetically quick-footed can respond to the altered conditions. Evolution seems to be "pumped" by these cycles of crisis and stability.

This brings us to the second point, the cretaceous catastrophe, which is perhaps a vivid example of a crisis period. A few years ago a group of scientists at UC Berkeley led by physicist Luis Alvarez (Nobel laureate for the discovery

meteors are very rich in iridium, the Alvarez group interpreted the iridium enhancement as evidence that a large chondritic meteor (perhaps 10 km in diameter) collided with the Earth. They showed that the dust from such a meteor strike should blanket the planet for a period of months or years, blocking sunlight, inhibiting photosynthesis, and killing a sizable fraction of the species in the oceans and on the land. That's how the dinosaurs died.

This theory, while still controversial, has received growing support from many quarters and is becoming well established. There is even speculation that Iceland, which developed from sub-ocean volcanic activity starting about 65 million years ago, may have risen from the hole punched in the Earth's crust by the cretaceous meteor. Archaeologists have searched the fossil record for evidence of other similar die-offs of many species and have produced a spiky curve of extinguished species, with the cretaceous extinction showing up as the largest among many such spikes. Some have claimed to see a periodic pattern in this curve and have interpreted it as evidence that perhaps ten such catastrophes have occurred regularly every 26 million years (fortunately with 13 million years since the last one). This has led to searches for a hypothetical "Death Star" (already named Nemesis) or a rogue planet (Shiva) which dumps debris from the cometary belt into the inner Solar System regularly every 26 million years because of the characteristics of its orbit.

As a person who has to look at poor-statistics data more often than I would like, I can't really buy these Death Star



Illustration by William R. Warren, Jr., 1985

of the antiproton) and his geologist son Walter Alvarez discovered that there is a large concentration of the element iridium in a 65 million-year-old layer of sedimentary rock. This clay stripe in the geological strata is the boundary marking the end of the Cretaceous period, the last age of dinosaurs, and the beginning of the Tertiary period, the first age of mammals. Since chondrite

theories, attractive though they may be from an SF perspective. It's easy to see patterns where they don't exist, as has been proved over and over in the scientific literature. The data looks to me like a random process with an average time between big crises of about 20-30 million years. This is consistent with a calculation by the Alvarez group which estimated from meteor size-frequency distributions that a big meteor (say 5-15 km in diameter) should hit the Earth about every 100 million years on the average, with smaller meteor hits more probable. Thus a regular but random bombardment of the Earth by large chondritic meteors could account for the mass extinctions observed and for at least some of the punctuated equilibrium in the evolution of the surviving species.

And this brings us to the third idea, the 3:1 resonance. Where do these chondritic meteors come from? One possible source is the asteroid belt between Mars and Jupiter. But this would require that meteors in large numbers be dumped out of stable orbits in the asteroid belt, and until very recently no plausible mechanism could be found to do this. Now such a mechanism seems to have been found. At a distance of about 2.5 times Earth's distance from the sun there is an empty band in the asteroid belt. In this empty band of orbits an object would circle the sun in a time which is just 1/3 of the 11.9 year orbital period of Jupiter. Thus every third time an object in this orbit comes back to the same position, Jupiter is also in the same position and kicks the same way with its gravitational field. These repeated kicks in the same direction accumulate and make the orbit unstable. This is called

the 3:1 resonance mechanism. It is a phenomenon which is also observed in the rings of Saturn.

Objects in the 3:1 zone have unstable or "chaotic" orbits which depend very strongly on minute details of position and velocity. Such a chaotic orbit, while it can in principle be calculated from Newton's laws, is essentially random and unpredictable because it changes violently with small changes in position. Treating chaotic orbits statistically shows a significant probability that "Apollo-type" Earth-crossing orbits are produced. Asteroids in such Earth-crossing orbits have a high probability of eventual collision with the Earth. Simulations with this mechanism account for about the number and direction of chondrite meteorites observed to fall on the Earth. The 3:1 zone is a sort of celestial shotgun with a good supply of ammunition provided by the asteroid belt. Even quite large asteroids can wander into this 3:1 zone and be propelled in the direction of the Earth, with about the probability calculated by the Alvarez group. Jupiter and "Shiva" may be the same planet.

Now I would like to put these ideas together into a model of how intelligent life evolved on the Earth. The punctuated equilibrium theory indicates that there has been a certain rhythm to the evolution of life. I would like to suggest that the principal "pump" driving that rhythm is the occurrence of large and medium size meteor strikes from the 3:1 zone of the asteroid belt. Such meteor strikes, we suggest, produce the majority of extinctions and "punctuations" shown by the fossils. If this crisis pump cycles too fast the catastrophes occur



too often and are too wasteful of life, too likely to extinguish promising species, and too close for the species to adapt fully to the reshuffled ecological niches before the next cycle; and so evolution proceeds more slowly. If the pump cycles too slowly the rate of crisis-stimulated evolution will also be slowed, and species may become so firmly ensconced in their niches that they will die rather than change when displaced. If the pump doesn't cycle at all we are back to the Darwinian limit of gradualism, which on the basis of fossil evidence between punctuations means very slow evolutionary progress, if any.

So there must be an ideal crisis/catastrophe rate which speeds evolution along at an optimal speed by blasting species out of their niches and weeding nature's garden at just the right time to promote improvement. I would like to suggest (without any evidence whatsoever except the Great Silence and the existence of intelligent life on Earth) that the average of 20-30 million years or so between big catastrophies is near this ideal. The pump of evolution on Earth must have a resonance, an optimum speed, at nearly that rate.

When a random solar system forms, the circumstances would have to be *very* special to reproduce both (a) an Earth-like environment and (b) an asteroid belt which provides just the right bombardment rate for a proper pumping cycle. The mass of the sun, the orbital radius of the Earth-like planet, the mass and orbit of a giant jovian planet, the presence of an asteroid belt with just the right range of orbits and densities—all of these must be tuned just right to get the pump running at the right speed. It happened this way in our system but

would seem to be extremely unlikely for an average life-bearing planet around an average star.

In the categories presented in David Brin's article, this explanation doesn't quite fit. It is a sub-class of Category 6: *Dangerous Natural Forces*, but in this case just the right amount of danger is an essential ingredient for evolutionary progress. Otherwise you will end up as either a trilobite or prematurely extinct. In the Drake formula (see Brin's article) the pumped evolution scenario greatly reduces  $f_{\text{z}}$ , the fraction of life-bearing planets that are able to produce intelligent life, since only that very small fraction of planets with an optimal catastrophe rate would qualify.

So that's my explanation of The Great Silence: we haven't been contacted by an Elder Race because we *are* the Elder Race. We happen to have evolved on a planet where evolution is pumped to progress faster than almost any other place in the universe. This puts an awesome burden on our shoulders. We can't just sit around waiting for superior aliens to show up to teach us the right path and reform our character. Instead, it is our duty and responsibility to reform ourselves and then to go out and seed the universe with intelligent life. I believe that we're up to the challenge. Do you? ■

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Tom Ligon

# THE DEVIL AND THE DEEP BLACK VOID

The most tragic  
dilemmas  
are those  
which have  
no truly  
"right" answer.

Nick Jainschigg



Eighteen years ago I became the first native, the first creature larger than a paramecium to be born on Mazra'ih. The name recalls from Baha'i history a peaceful and beautiful refuge in a strange and hostile place. It was fitting that our new planet be called Mazra'ih, for my people adopted it as a refuge from persecution, and cultivated it as a garden where other downtrodden pilgrims could find peace. But like its namesake on Earth, we were forced to leave it. We left hurriedly, without a chance even to bury our loved ones.

Two billion kilometers in system from us, Mazra'ih twirled and circled as it had for billions of years, oblivious to the torment in the recent biological infestation on its previously lifeless surface. Our barely terraformed world was now a death camp for thirty thousand captives held by three thousand fanatics. Our experiment in pacifism ended with the arrival of the Mihdi, the self-proclaimed Messiah banished from Earth for his antisocial tendencies and damned by his Islamic brothers for his unspeakable desecrations. We were among the few to escape in the tradeships that had the misfortune to be nearby, but our heavily burdened freighter was slow, and another vessel reached our destination before us.

We watched helplessly as thermonuclear fire from the engines of the Mihdi's raider brushed the huge disk of asteroid-steel girders that spread across our telescope screen like a delicate moonlit spiderweb. Our hopes for a safe escape vaporized with the metal of Sol-Bab, the Thompson Gate that was our only way back to Earth. Without the Gate, the only way in or out of our re-

mote star system was by starship. Our overburdened fusion drive interplanetary craft could make the trip in a few millenia. We had rations that might keep our band of a hundred and forty-two refugees alive for a few months. We were free of the genocidal tyranny of the religious fanatic who had usurped our refuge, but freedom is a relative thing. What good are ten to the thirtieth cubic kilometers of space on one liter of empty stomach?

"We're trapped." Commander Jinnah Abdolrhim said calmly. His homely boyish face gave little hint of the seriousness of his words. One could almost believe he was referring to a chess game instead of slow death. Almost. The gray-streaked black hair around a face that should have belonged to a twenty-year-old had been earned through thirty years of space duty. Jinnah was a commander because he could keep his head in an emergency, and because he was formidably competent.

"Are you sure?" my father asked. "It still looks intact. Maybe the damage is only superficial." My respect for my father dropped another notch. He had a face that was easy to trust, until you finally realized he didn't have the common sense to distinguish a forest from a knee-high tree. It had taken me most of my life to realize it. How the others on board still trusted him I may never understand, for my father, a Vazir of Mazra'ih, was one of the idiots responsible for allowing the Mihdi to immigrate.

"Perhaps a bullet in the brain is merely a flesh wound," Jinnah reiterated in the same casual tone. "They hit the wave generator. We're trapped."

“Why?” Ayn asked, twisting her sweet old face into an anguished knot. “Why did they do it? Don’t the Shi’ihs realize they still need support from Earth?”

“Support for what?” Jinnah asked. “To build habitats for immigrants? To build industry? The Mihdi now has exactly what he wants, a habitable planet all his own and time to consolidate power over it. He doesn’t have enough weapons or people to stand up to an outside threat, so he eliminated it.”

“We could still get help by starship, couldn’t we?” Ayn turned her face toward the screen again as if she were asking for assurance from the damaged Gate.

“We could, but we won’t,” Jinnah replied. “The Gate Operations Center at Earth will send an FTL scout as soon as they realize they’ve lost the alignment puck. The crew will discover what’s happened here and run for home as fast as they can.” Jinnah was a cynic. Jinnah was correct.

There was an attempted terrorist hijacking of a starship about five years ago. It was never proven, but most everyone believes the Mihdi was behind it. We realized then there was another reason for sabotaging the Gate. He wanted very much for Earth to send a starship. After all, now this was his home court, and he had no more need for Earth. The thought was chilling.

It’s ironic that the device mankind so fondly dreamed of would turn out to be such an enormous threat. Even a tiny scout ship, in the hands of a suicide squad, could end all life on Earth in a matter of seconds. A ship large enough to carry refugees could splatter the cra-

dle of humanity without more than a quiver felt on board. Driven by a c-prime engine to many times the speed of light, and insulated from the harsh realities of normal Einsteinian space-time by a super-relativistic Higgs field, a Thompson drive ship can ram a planet like a meteor hitting a melon. Relativity prevails: energy still equals mass times the propagation constant squared, and c-prime squared is a very large number. A starship is an irresistible force, and not the sort of thing you want a religious fanatic to get hold of. That is precisely why Dr. Thompson designed the Gate.

Thompsonian Relativity tells us that the visible Universe is a stasis field in which the speed of light,  $c$ , is the snail’s pace nothing can exceed. There is at least one higher-order propagation constant,  $c$ -prime, and perhaps many more. The discovery of the next faster energy form opened, literally, a new Universe, one in which the visible Universe is but an insignificant bubble. With the same stroke, the conventional concepts of space and time were demolished. Soon after the first starship was built, some of the implications of those facts led to the discovery of quantum teleportation, and made the Gate possible. The enormous quantum displacement transceiver could project any ship across the 97 light years to a similar unit near Sol in the blink of an eye. The extraordinary alignment between units was maintained by exchanging a small puck every few seconds. Even if the Sol-Bab could be repaired without outside help, realignment could easily take several years of trial and error transmission, coordinated by starships. In the meantime, any ship attempting to enter or leave our system

by the Gate would find itself materialized outside the visible Universe with no hope of return.

Our problem was not one that could be solved by the power of starships. Planet-smashing is an impractical way of convincing extremists to give up their captives, and starships are little better than fusion-powered spacecraft in a more conventional fight. Neither was the Gate a solution, only a tunnel leading from a prison whose walls were time and distance. The problem was as old as the human species: the problem was humans. How could we expect technology to be our salvation? I could sense the helplessness of the Elders; they didn't really understand it. Oh, they understood the physics, and they understood that we were trapped, but they didn't understand the inhumanity. Neither did I.

"What are our options?" my father asked.

"We do have quite a few options," Jinnah replied. "We could return to Mazra'ih and be martyred. We could run away until we're out of fuel and spend the rest of eternity exploring the heavens as frozen, starved corpses. We could dive into the sun and deny them the satisfaction. We could stay in the system until pirates find us."

Pirates! On top of all the horrors to confront us on the planet, now there was no one we could trust in space. Never before in the history of human space-travel had there been pirates. Like most new settlements, it proved more practical to fly in asteroid-based manufacturing technology than to establish surface facilities from scratch, and like most such facilities, there were fortune hunt-

ers among the crews. The Mihdi quickly demolished the tiny law enforcement forces in our system, and the baser side of human nature took its course. While the pirates were no match for the Mihdi's warships, ships full of refugees carrying every valuable they could hold fell easy victim to vessels that could carve chunks from asteroids like slicing a turnip. Now, with the Gate gone and the planet unapproachable, they would be joined by others. Desperation would compel it.

"We could return to Mazra'ih and fight," I offered.

Jinnah smiled. "Of course we can, Hab. We will take on the Righteous One's warships with our mighty micro-meteorite defenses. We will land this army of a hundred and forty-two highly trained farmers in a decrepit four-seat Sunfire and march on his bastion, shrugging off nuclear weapons as if they were mudballs. Then we will shake our fingers in the face of the Holy Savior because we forgot to pack any guns."

"Habakkuk does not understand the horrors of violence," my father offered. "He speaks with the rashness of youth."

"Your son speaks with more sense than you, Vazir," Jinnah countered. "You're the ones who established a colony based on freedom *and* pacifism. The first Shi'ih madman to come along with a few nuclear weapons stashed in his luggage took over without a fight. You've let him carry out mass exterminations with hardly a whimper. You run away when he takes the planet you've terraformed with your own sweat. And you *invited* him here, for God's sake!"

“He was persecuted on Earth, just as we were.”

“Is your memory that short that you don’t remember who persecuted you?”

My father didn’t answer.

I scanned the screens again. “Well, we’d better make some decisions soon. It won’t be long before those asteroid ships get over the shock of having their Gate destroyed and realize we’ve got no place to go.”

Nobody said a word. I twiddled my thumbs. “Well? Lead us, Oh Wisened Elders. Show this band of hopeful pilgrims the way to safety.”

The Elders looked at one another sadly. An alarm screeched on the communications panel and Jinnah swatted it off as the message flashed on the screen. Another emergency. That made eight so far.

MAYDAY. FREIGHTER BNH-573 REPORTING PURSUIT BY HOSTILE SHIP. WE HAVE INSUFFICIENT FUEL TO EVADE AND RETURN HOME. WE ARE USING OUR RESERVES TO ACHIEVE EVASION VELOCITY. OUR SUPPLIES SHOULD LAST AT LEAST A MONTH. PLEASE SEND A RESCUE SHIP.

Coordinates and other useless information followed. God save them, for no one else could.

“Is that how you wish to end it, then?” Jinnah asked the Elders. “A last desperate sprint for deep space, to starve while waiting for rescue?”

“Surely they will send help,” Caleb said, but his voice was more of a question.

“No,” my father answered. “Not even rescue ships. Jinnah is right, the risk is far too great. The United Nations has never been willing to save any nation from itself. You cannot help a peo-

ple who will not help themselves, and you cannot risk all of humanity to save what amounts to the population of a small city.”

“But the planet . . . Mazra’ih is valuable to them!”

“The planet will be there. We may not.” My father shook his head. “They can wait. Tell us, Jinnah, what would you do?”

The commander pondered, then said, “I would go back.”

“But how?” Caleb cried. “Space is full of bandits, and home is ruled by a killer.”

“Space is anything but full,” Jinnah said. “There is a way back, I think. Once there, I don’t know what you will do, but I would find a way to fight.”

“That we will not do, Jinnah,” my father said. “We will trust in God. There is no crime so great against our people as to justify that we ourselves commit as great a crime, but we do Him no good drifting about out here. Let us go home, if there is a way, and there await the Will of God.”

“You don’t suppose God could have a few thousand tons of deuterium waiting for us, do you? We’ll be rather low when we get there. The Mihdi’s ships will, on the other hand, be nicely topped up.” The Elders glowered at the Commander with the condescending look they reserve for the unfaithful. Jinnah sighed, and set about programming the navigation computer for a return orbit. The Elders groped and pulled and made their way off the cramped flight deck in weightlessness, past the gawking mass of refugees still trying to digest the grim news.

When they were gone, I pushed my-

self over to the console where Jinnah floated, trying hard to look like an experienced spacer instead of a kid who begged for every chance to fly the village flivver. "Jinnah, I'd fight, if I had the chance."

"You would? Do you think you could kill a man, Hab?"

I hesitated. It was a difficult question. "I would try to avoid it. If there were no other way, I think I could."

"You want to fight but you don't want to hurt anyone?" Jinnah smiled and put his hand on my arm. "Hab, these people who have taken over your world, for them war is a way of life. They thrive on it. They enjoy it. They worship it. They not only would not hesitate to kill an infidel for the slightest excuse, they'll go out of their way to make an excuse. Can you understand that?"

"I've come to know it. I don't understand it."

"That's because you were raised better than they were. Forcing you to kill would be worse than death itself. You have the curse of a Baha'i conscience."

"Now you sound like my father and the other old people."

"No, I sound like someone who had your problem once himself. Fighting is an idea you aren't accustomed to. Not that you'll get a chance to anyway, or that it wouldn't just make matters worse."

"Are you saying there's no solution?"

"No, and even if there were no solution, it doesn't mean there's no course of action that's right."

Jinnah's ploy for avoiding the pirates

worked. We had been less than halfway to the Gate's distant orbit around Nur, the friendly yellow star that warms our little system, when the Holy Savior's warship cut off our escape. At that range, instruments could detect a ship only if its approximate location were known, or if an exhaustive search were made. After Jinnah burned the main engines to set our trajectory, he fired the chemical thrusters long and hard to change our orbit slightly. A pirate might have seen our first burn and planned to intercept us, but he'd find only empty space where he projected we should be.

In the days that followed, I spent more time with Jinnah than with my family. I admit it, I had a case of hero worship. A Baha'i farming community tends to be short on heroes, and since the massacre mine was shorter than most. A spacecraft commander with courage enough to take on refugees and run a gauntlet of pirates was hero enough for anyone. Jinnah and his crew knew the risks were great, and they had nothing to gain, but they did it anyway. While my father steadfastly refused to stand up for us, Jinnah was hopeful for a solution. Hope was what I needed.

Two weeks into the return flight, I had a chance to speak to him alone on the flight deck. "Jinnah, what will we do when we reach Mazra'ih? If we drop into orbit, won't we be killed?"

"There are orbits, Hab, and then there are orbits. The Mihdi's ships have a lot of firepower, but they are still basically freighters. They don't have the sort of detection and tracking equipment a military or survey ship has. Here is the plan."

Jinnah called a diagram up on the



navigation display, and described what he had done. The diagram showed Mazra'ih, its three little moons, and the three warships in Clarke orbit over the settlement area. "We'll sneak in by hiding behind rocks," he said with a grin as he pointed to the screen. "If we make burns here, here, and here, the moons will eclipse them from the warships. Hellspiral produces enough background noise that they may not detect our exhaust if they can't see the plume directly. We'll gravity-sling off the last burn, here, and drop into a very large orbit. If we tumble a little we may look like some of the space junk that's been hauled in here."

"It is a beautiful plan, Jinnah! I know it will work."

"It is a terrible plan, Hab. It depends on luck. If they are looking for us, they will find us. Besides, it accomplishes nothing. What we need is an organized resistance."

"How are such things done?" I asked.

Jinnah pondered. "Perhaps we could free prisoners, and around them form an uprising."

I shook my head. "There are no prisoners. The Holy Savior's 'justice' is immediate and permanent."

"Then the general populace must be roused. Baha'u'llah Himself sanctioned the community's right, even its obligation, to defend itself against pillage and murder."

I sighed. "A community in general, yes, but the Baha'is as a religious body . . . He forbade it expressly. We cannot be called to arms. Besides, unified we would make a good nuclear target."

"And spread out you make good target practice. OK, then they could follow Gandhi's example of peaceful civil disobedience."

"We have tried that already," I lamented. "It is a very efficient way to make the list of martyrs longer. The Mihdi considers almost any resistance besides self-starvation a capital crime. The Righteous One would be quite pleased to have us starve ourselves to death to save him the trouble of doing it himself. Besides, such a tactic is primarily designed to sway world opinion. The Holy Savior has cut us off from the only other world who's opinion counts."

"You're right," Jinnah agreed. "What of the other groups that share the planet? Certainly some of them would be willing to fight. Who are they?"

I thought. There weren't many other groups and their populations were small. By the little contact I'd had with them, I knew they had mostly been attracted by our Charter's promise of religious freedom. Most off-worlders consider Mazra'ih barely habitable yet, and we have deliberately never made a point of looking for valuables here in order to avoid attracting the wrong types. The planet itself is our product, more valuable than any mineral or merchandise. I guessed at a group I knew little about. "There is a colony called the Lennonites."

"Forget it," he said. "Baha'is are bloodthirsty by comparison. We need someone who will fight. Elrons would be good."

I pondered at length, then smiled. "There is a group from America who are not Baha'is. They are Christians, I think."

Jinnah returned my smile. "Excellent! What do you know about them?"

"Not much, I'm afraid. What difference does it make? You speak as if we could reach the planet. All we can do is orbit nearby and wait."

Jinnah looked back at the screen. "Perhaps not, at least for a few of us. Our last maneuver is to make a burn extremely close to Aqa—" he pointed to the largest moon—"Then use it to gravity-sling us into the proper orbit. At that point we could launch the Sunfire, drop it close to the moon's surface, and send it into a re-entry trajectory."

I checked to see if he had a straight face. He did. "Jinnah, that would take days!"

"Three and a half, to be exact. Admiral Fletcher spent over twice that long in one during his Contact Flight. Chances are about even they would think the Sunfire is only a meteor, as long as it follows an innocent enough trajectory and tumbles a bit."

"But if they discover the Sunfire, they'll find the freighter."

"Yes," Jinnah agreed, "but if they don't find the freighter, we'll probably starve up here anyway. There's about a one in a thousand chance we can change things for the better down there, and that makes it worth the risk."

I tried to imagine spending three and a half days in the tiny four-seat ion jet. My people have, I know, endured far worse, but the prospect was not pleasant. Neither was starvation.

"Where is this colony?" Jinnah asked.

I rotated the globe on the screen. "About here, 500 kilometers west of 'Akka. Could we land there without being noticed?"

"I hope so. Can you find me some volunteers among your people?"

"Without telling my father?"

"Particularly without telling the Vazir."

I left feeling a glimmer of hope that made up a bit for the emptiness.

My father hid his resentment well. "So, Jinnah, I understand you have found a way to return a few of us to Mazra'ih."

"Yes, Husayn, but only four. It involves a long trip in the Sunfire." Jinnah explained the details with complete innocence.

"It would be most appropriate if some of the Ministers and I should return." My father averted his eyes. "Fleeing in the face of persecution is almost the same as denial of Faith. Our people need a better example."

"You know it's suicide, don't you? If the Mihdi finds out you're back, he'll kill you and everyone who's helped you."

"We know—" my father motioned to the other Elders—"and we also know we risk the ship. We plan to turn ourselves in as soon as our people know we have returned, and claim we have been hiding in the wilderness. We will be killed, but at least our people will have an example to strengthen their faith."

Jinnah closed his eyes. "You will need a good pilot. I can't spare any of the crew, and Hab knows the Sunfire better than anyone."

"I agree, though I do not look forward to the martyrdom. Perhaps he can be hidden."

“We’ll all be martyrs soon enough, Vazir.”

“Can we land at ‘Akka?”

“Only as dust. It is too heavily defended. I have in mind the Christian settlement to the west, the village of Lancaster. It could be that the Sword of Righteousness has ignored it to concentrate his wrath on Baha’is.”

“I know them,” my father acknowledged. “It is a good choice.”

“You have two days to prepare. I’d recommend fasting.”

“It will be done.” My father floated back into the corridor. The Elders followed. I stared after them in dumb shock.

“Jinnah, you can’t let them do it!”

“How do I stop them?”

“You command this ship.”

“The Sunfire belongs to your people, Hab.”

“Then I’ll sabotage it.”

“I’ll blister your backside if you do. Would you rather see your father starve to death, or die doing what he believes in?”

I couldn’t answer.

Jinnah shut the cabin hatch and whispered. “The whole thing now depends on you, son. How much did he know of our plans?”

“Not much, I think,” I answered. “I said little to those I asked, and I suspect he got the information second-hand. What do we do now? We need your leadership down there.”

Jinnah shook his head. “That you would not have had in any case, Hab. I must stay with the ship, and so must my crew. It takes all six of us to keep this overloaded life support system working.”

“But I know nothing of revolution! What good can I do by myself?”

“Get in touch with the Christians, and take this.” He pressed a spot on his desk and a panel slid open. He pulled a huge black pistol from the compartment the panel concealed.

“Jinnah! That’s a gun!”

“Shhhh!” he whispered as he popped out the magazine and opened the action. “So, you think you know what it is? Actually, it’s a 9mm automatic pistol. Most freighter commanders have them. It’s a trade secret.”

He handed the wicked-looking instrument to me and I accepted it cautiously. “But what good is one pistol against the Holy Savior’s militias?”

“One pistol can capture a dozen rifles, and a dozen rifles can capture a small army. With luck, maybe you can even capture his nuclear arsenal. The Mihdi’s resources are limited, and he can be beaten if you play it smart. The Christians will know how. By the way, do you speak English?”

“Certainly,” I replied in English. “Also some Russian,” I added in Russian. “I’ve made it my business to learn every language a starship commander should know.” The last line was in Esperanto, the language the Baha’is have been halfheartedly talking about adopting since it was invented.

“Show-off.” He made a face. “Your Persian is flawless, too. The Christians will probably need a lot of help in that department. You could be a spy. Of course, they shoot spies.”

“They shoot everybody. Why not die for a reason?”

Jinnah spent several hours instructing me in the use of the pistol and the ways

of guerilla warfare. He explained the purpose of the little hole in the tip of the bullets. Afterwards I felt sick and went to my bunk. That evening I had nightmares.

Things happened fast behind Aqa. The landing bay doors were open as we approached the moon, and the shock-wave-laced arms of the Hellspiral loomed outside. The ominous black limb of the moon below us quickly blacked out the delicate but deadly violet plumes that dominated the night sky and made our world so special.

The Sunfire was shrouded in a loose layer of conductive film to soften its radar reflection, and looked like a trash bag set out by the street for collection. As the freighter's fusion engines fired, the forward landing bay bulkhead glared blue-white, even through the canopy filters, and the moon below lit up as if by sunlight. The normally sluggish freighter, its bunkers now almost empty, decelerated with authority. The four of us held on as the Sunfire shook and bucked against the docking cradle, for the safety straps that normally held the little ship secure were stowed away against the necessity of a quick departure. The burn took only seconds, then there was a loud clang as the cradle spit us from the freighter's belly. I felt a humbling sense of helplessness as we shot away from the sheltering mass of the big ship. The laws of nature had ordained our course, and it would be close.

The freighter itself would pass only twenty-two kilometers above the peaks. In order to get a useful sling effect from the tiny moon, the Sunfire had to pass

closer than the surface. Aqa, like most small moons, is irregularly shaped, and is tidally locked to its parent planet. Aeons ago some terrible impact left a ragged crack on one side of the rocky body, and the trajectory we followed would take us through that deep canyon. We were on the dark side of the little moon as we dropped toward the crack. Aqa was an ominous darkness against the stars at first, then a dim field of jagged starlit rock. The darkness came up around us and my father began to pray.

The light at the end of our tunnel was the terminator. A few patches of light whipped by our canopy at first, then the canyon walls burst aghast as we entered the dawn. The razor-sharp peaks looked horribly close as they raced by through the clear vacuum, but the plastic draped over our ship barely moved, and there was no sense of motion except our vision. The nose of the Sunfire was pointed down part of the time, exaggerating the feeling of impending peril. The danger passed from our minds as we cleared the canyon rim and Mazra'ih rose above the horizon.

Mazra'ih, the beautiful planet on which I was born; the world blessed because it is doomed. We watched our first planet-rise in awe.

Nur is the distant companion of a triary system. At the center of the system is a neutron star with a small red companion. The red dwarf pours gas into the steep gravity well of the neutron star, which ejects two powerful jets of plasma at its poles. Every twelve thousand years or so, Nur passes through one of the Hellspiral's deadly violet arms, dragging Mazra'ih with it. The

jet causes Nur to flare, and overheats the planets in her care.

When Mazra'ih was discovered, it was as the scientists have said Earth once was: lifeless, with oceans of chemical soup, and a slightly greenhoused atmosphere with no free oxygen. Humanity has discovered many Earth-like worlds, and on all but three life already existed, precluding colonization. The other two known primordial planets orbit stars that flare every few hundred years, making them next to useless. My world is the rarest of gems.

The planetologists studied this promising new world with unparalleled enthusiasm, then reluctantly turned it over for terraforming. The engineers collected a few Apollo asteroids, the burned out heads of old comets, and pushed them into L1 orbit between the planet and Nur. They blasted a cloud of debris from those celestial dustballs to provide a bit of shade and drop the planet's temperature to a more appropriate level, until photosynthesis could gobble up the excess carbon dioxide in the atmosphere. Next, they went off to gather cometary ice to begin rehabilitating an atmosphere ravaged by periodic encounters with the undead star sucking life from its helpless nearer neighbor. While the engineers moved masses greater than all the cargo ever moved by all the ocean-going ships of Earth, the biologists had an easier job. The planet was hungry for life.

Many people do not understand the speed with which Mazra'ih became habitable. Consider the average bacterium, only a micron in diameter, capable, on a slow day, of reproducing every two hours. Given fair conditions, in a day

it will produce a colony sixteen microns across. In five days, its progeny could fill a sphere over a meter across. In ten days, the sphere would have to be 550 kilometers in diameter. After two weeks, the sphere would be 72 million kilometers across, and expanding at four million kilometers an hour in all directions. Fortunately there are limits. Mazra'ih was terraformed with the same time-proven genetic engineering technology that worked for Venus, but the conditions on Mazra'ih were more suitable.

Our colony was formed to carefully establish and manage higher life forms. A visitor may see our bright green seas or the uncultivated wilderness and dismiss my home as a dismal ball of slime, but I have watched the miracle taking shape almost from the first year of colonization. Mazra'ih will be another Earth, a paradise for mankind for the next eight thousand years, until it once again passes through Hell. By then, perhaps, we will no longer have a need for planets. We gazed lovingly at our home, trying to understand how anything so beautiful and dear could bear the horrible hatred hidden beneath a thin swirl of clouds. I touched the reaction controls and began our meteor imitation.

If things happened quickly near the little moon, time slowed to a crawl as we tumbled across the void to Mazra'ih. Now there were no longer even visual references by which we could judge our progress, only the almost imperceptible growth of the lovely planet that crossed our field of vision every few minutes. My father and the other Elders prayed and discussed theology incessantly. I pretended to listen in interest, but kept

one ear plugged into the radio, listening to the propaganda of the Shi'ih's, hoping to find a sign of weakness.

Weakness, by all accounts, was not a Shi'ih problem. They had already turned one town, and a considerable amount of surrounding land, into a crater, just to prove they don't bluff. Any uprising, they promised, would result in further demonstrations of nuclear barbarism. They announced with pride the executions of Baha'i "gangsters and insurrectionists," as their militia moved from town to town to purge the planet of the followers of false prophets. The Righteous Master claimed divine guidance, and called on God to strike down the enemies of Islam, though the reports indicated the deaths were due primarily to bullets, not lightning bolts.

When I tried to sleep, I saw rotting Baha'i bodies with half their heads missing lying in the streets of my village, and Shi'ih heads erupting crimson gore over the sights of a black pistol. The dreams would build and the bodies piled deeper until I awoke with a scream. The Elders tried to comfort the poor boy who had seen too much, without knowing the real problem.

Re-entry was a tricky affair. I am a fair pilot, given some air around me, but I'd only made high orbital flights twice before, and never a lunar re-entry. First, I had to zip the Elders into a rescue bag, then crawl outside in a lightweight pressure suit to dispose of the filmy shroud around the Sunfire. It was great to be able to stretch out and enjoy microgravity, except for the two millimeter cord holding me to the ship and the fact that we were due to collide with

the atmosphere shortly, at eleven kilometers a second.

Normal high-speed re-entry calls for making several shallow skips into the atmosphere to scrub off speed, followed by a long glide through the upper atmosphere, but the procedure takes almost a full orbit. To avoid detection, we had to re-enter on the uninhabited and unwatched "backside" of the planet, and that meant a sustained retrofire and an old-fashioned steep re-entry. The Sunfire carried a full load of water to cool its lifting surfaces and to feed its ion jets for thrust in space, but we had to exceed the design limits for both power output and temperature. I followed the program Jinnah had laid out, but the technique was untried.

The computer complained and moaned the whole way, and for good reasons. I didn't know a Sunfire could hold together with the lower leading edges glowing white-hot. I don't really know how hot the belly shield got, because the sensors went out of range at 2400 degrees. I could see a line of orange creeping around the nose toward the canopy, and wondered how close it would get before the plastic started to melt.

Once the little jet slowed down, had some rarefied air to breathe, and its fuselage had a chance to cool, I relaxed. The instruments didn't indicate that we had been radar-scanned, but I throttled up the reactor and took the ship down deep into the troposphere for a leisurely flight back to civilization. That was my intent, anyway. The ship wouldn't handle right, and I was afraid to land in the wilderness below to find out why for fear we might not be able to get airborne

again. Below us was a vast world with water and breathable air, but even though the seas teemed with microorganisms, much of the land mass was almost lifeless. Where the land could support it, the single-celled life blooming and dying, decomposing and feeding another bloom, building a bed for more complex forms of life, was not yet land a human could live on. Natural shelter often collected poisonous gases, and there was nothing to eat.

I fought the controls through the night and into the next morning before we came to the Christian village we had selected. It stood out from the virgin terrain, the only spot in a hundred clicks with any plant bigger than a weed. I prefer a place where the trees are taller than I, but the settlement was only two years old. Their runway was adequate, and I saw no sign of soldiers. I set the Sunfire down beside freshly plowed fields, and shut the power plant down.

A large tractor approached as we climbed out into the marvelous clean air and the fertile smell, what offworlders call the stench, of newly biofactured soil. My father stepped over to greet the driver. The man shut off the tractor's engine and climbed down.

"Greetings, brothers," he said cautiously. "What be your business here?"

My father extended a hand in friendship. "I am Husayn Safwat Vazir. These are Caleb Dyan and Franklin Robertson, also ministers of the government. The young man paying more attention to the underside of our plane than to our host is my son, Habakkuk."

The man accepted my father's hand. "Of course, Minister! I should have recognized you. You are certainly welcome

among the Society of Friends, but we had best get your craft inside before it is discovered. You look like you haven't eaten in days. There'll be hot stew in the kitchen."

We set about hitching the Sunfire to the tractor and towed it to an outbuilding, then drove back to the main compound. There a crowd gathered quickly.

The crowd moved into a large building that was the source of the most marvelous fragrances I can remember. I never found out what was in the stew, but I suppose it was made with rare delicacies transplanted from secret gardens in America. The bread was undoubtedly Manna, and spread with real butter. Then again, it is possible the liquid nutrient we had been sipping for six days was wearing thin on my palate.

"I fear we put you in danger," my father said to the settlement leaders.

"Let us worry about that," one of them answered.

"Just the same, we need to get back among the Baha'is as soon as possible, preferably without the Shi'ih's knowing we've been here."

"That can be arranged, but what will it accomplish?"

"It will let our people know their leaders have not deserted them."

"It will also let the Shiites know."

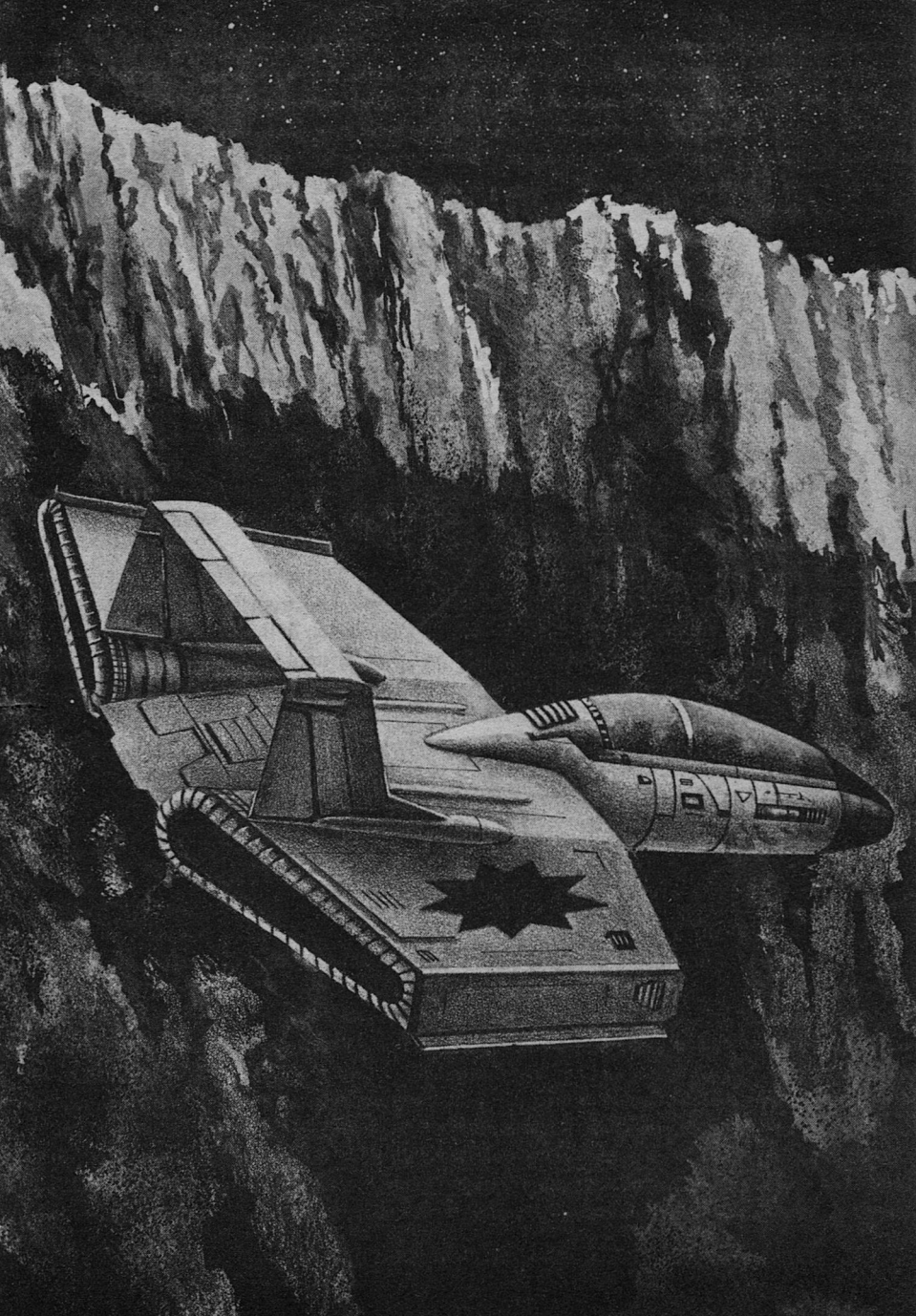
"We will turn ourselves in to them, to prove to them we do not challenge their authority, and show them they have no reason to persecute us."

"They'll kill you anyway."

"We know, but it is the way we have been taught. If we do not follow it, how can we expect our brothers and sisters to stand by their faith? And if we strip







them of their faith, what do they have left?"

I couldn't stand to listen any more. As the old men babbled on, I started making friends with some of the younger Christians. After a few casual questions, I found another eighteen-year-old whose feelings toward the Shi'ih were less than charitable. His name was Jeremy.

We stepped outside to get away from the mindless chatter. "Jeremy," I asked, "I want to fight them. Can you help me?"

He stopped suddenly and stared at me. "You're a Baha'i. Bahai's don't fight."

"This one wants to. I'm sick up to here of people who say evil should be stopped but it is evil for us to be the ones who do it. Can you help me?"

"You've got a lot to learn about Quakers," he said.

"But you're Christians. Christians fight."

"Oh, a few Quakers have been known to wreak havoc with a bulldozer during wartime, but basically we're almost as bad as your people. You know, the meek shall inherit the Earth."

"Two meters deep, two long, and eight-tenths wide of earth," I answered.

"The same as the most powerful conqueror," he retorted. "Just a little sooner. I admire the courage of the Baha'is. I just wonder what my choice will be when the Shiites order me to renounce my faith or die."

"Then you won't help me?"

"I didn't say that. I'll help if I can, and if you have a plan that can work."

That was great. I was counting on the Christians to have a plan. "Then do you know of anyone who would fight?"

"I suppose there must be some. Contractors, maybe, or traders who weren't able to evacuate. Nobody I would know how to contact. The place to find out would probably be 'Akka itself."

That sounded reasonable enough. By my own experience 'Akka was also the best of all possible places to contact informants, and get yourself killed. I rejected the possibility of finding help there. "Do you have any ideas?" I asked.

"My sister thinks we should kidnap the old codger and haul him down to a mental health clinic. Maybe we could get some psychochemist to whip up a serum to sweeten His Holy Uppityness's attitude. It would work, but there's just one catch."

"Yeah. The nearest facility is ninety-seven light years from here. Jinnah—he's the commander of the freighter we were on—Jinnah thinks we need to start a revolution. Space science I know. Biology I know. Revolution my father never taught me."

"Have you considered nonviolent methods?" he asked.

"I have. I have a pistol and I have nightmares about using it."

"Ah! So the lamb has a stinger."

That made something connect in my mind. "If there's one thing you learn about on this world, it's nature. Every life form has some sort of natural defense. Maybe we can adopt one."

Jeremy nodded. "Hiding is one of the more successful tactics."

"Yes, and don't think a lot of us aren't trying it. But people need food, and that means agriculture, and agriculture can be easily spotted from space on Mazra'ih. Running fast is another

defense, but we just tried that. There's no place to run."

Jeremy thought. "Some animals have shells, but I don't know of any that can stand up to nuclear weapons."

I blushed. "Some species survive by outbreeding the predators. It might be fun to try, but I doubt it would work."

Jeremy grinned for a second, then frowned. "I remember how I felt when my father said we were coming here. It seemed like such an awful place. Now I know why your people came. One of the best niches in nature is one so inhospitable nothing else can live there. It worked well, until you made Mazra'ih a decent place to live. You destroyed your best protection."

"That we did." I paused to think. "Let's see, some animals survive by looking fiercer than they really are. Unfortunately, the Shi'ih know us better than that."

"Some animals survive by tasting bad," Jeremy said. "Nothing wants to eat them. I can't see how that would help your case, though."

I stopped and looked out over a pasture at the grazing sheep. "There's another, more successful strategy. One that works well when you're dealing with humans. Be good to eat."

"Huh?"

"Think about it. What is the fundamental law of survival?"

"Survival of the fittest?"

"No," I answered. "Survival of the genes of the species."

Jeremy looked puzzled. "That sounds like Darwinism. My father is a literalist. Evolution is a dirty word around my home."

"Sorry. I didn't mean to offend."

"I'm not offended, just curious. Do Baha'is accept the theory of evolution?"

"We accept all firmly founded science. True religion cannot contradict science. Actually, that's a Shi'ih teaching. They seem to have thoroughly forgotten it."

Jeremy shrugged. "Mazra'ih gives my father a constant case of heartburn. He's having to adapt his beliefs to the realities of the planet. Tell me about this gene survival business."

"It's simple, really. We exist to perpetuate the existence of patterns in polymers of nucleic acids. Survival of any given individual is unimportant to a gene line. Some individuals of a family may be sacrificed in order to ensure that its close relatives survive. Those sheep thrive because you breed them for food. Most die, but you carefully ensure that their genes survive. They are very successful because they are good to eat."

"Is that how you plan to survive?"

"It seems to be my father's approach. It won't work, though, and he knows it."

"Why not? Don't you think the Mihdi needs your skills?"

"Yes, but he doesn't need us so much that he's willing to lose control. A particularly insidious survival scheme is to eat from within that which eats you. Baha'is have an annoying habit of converting a hundred followers for every martyr. By that score, we should be able to convert the Mihdi's followers at least a hundred times over if he stopped killing us today. He won't tolerate that kind of threat. He wants us exterminated." I paused for a moment. "He wants our

Faith exterminated. That's our version of genetic continuity."

Jeremy turned to me. "And the survival of individual Baha'is is meaningless if their faith dies?"

"Exactly," I answered. "And if we fight, our Faith dies."

"Then there's nothing you can do," he said. "It's all up to the Shiites. They have to see the error of their ways."

"Fat chance. Anyone who can machine gun an entire village and then celebrate the event with a prayer service must be pretty confident that God is on their side."

His face grew pale. "You mean you know of such things? I'd only heard rumors."

"Three months ago in Bahji I watched them cut down most of my family and the girl I was to marry. They demanded that the townspeople renounce their Faith. Not one did."

"You must hate them."

"I did, for a while. That made me feel guilty. Then I started to hate myself for not being with my family when it happened. I think I must have burned out, because I hardly feel anything anymore. All I want is some reason to feel hope. At the moment, all I know is that organisms that don't adapt, don't survive, and that doesn't leave me much to hope for."

The nightmare kept me from sleeping again that night. Around midnight I slipped out of the farmhouse where we were staying and went down to the shed where the Sunfire was hidden. I took the pistol from its hiding place and sat in the pilot's seat, thinking.

Over two centuries ago, in August of

1852, a boy named Sadiq, grieving over the execution of the Bab, the predecessor of Baha'u'llah, fired a pistol at the Shah of Persia, slightly injuring him. Not only was Sadiq killed on the spot, but eighty Babis were tortured to death, and many others, Baha'u'llah included, were imprisoned as a result.

I should probably change my name to Sadiq, I thought as I sat surrounded by the cavernous, isolated darkness of the shed. Any uprising would certainly bring horrible destruction on my people, and an assassination attempt on the Holy Savior would bring the same. I took a bullet from the magazine and traced my finger around the hollow point. That one projectile could probably kill thousands of innocents. I put the pistol away.

I spent at least an hour trying to think of some action that could put a stop to the bloodshed. It was obvious we could only lose if we played by Shi'ih rules. Our only chance was to create a new game which suited our abilities. I turned on the computer and made a list of Baha'i strengths and Shi'ih weaknesses. I eliminated any Baha'i "strengths" that made us accept our fate passively, and ended up with a very short list:

Baha'i strengths - acceptance of science.

Shi'ih weaknesses - wickedness and narrowmindedness.

I wondered how I could exploit Shi'ih wickedness, but then decided I was wrong. The Shi'ih are a devout and faithful people, who diligently do that which they feel is truly the Will of God. I turned on the radio, hoping the Holy Savior himself would suggest a solution. I drifted off to sleep listening to

a prayer chant, and slept like a baby for the first time in days.

When I awoke it was almost noon. There was a handwoven blanket over me. I smiled, but wondered what my hosts thought of the list on the computer display. It was innocent enough, I supposed.

I started to rise, but heard the buzz of the earphone beside me. I plugged it back into my ear. The Mihdi was preaching to his followers again, and the sermon was as predictable as clockwork. As I listened to his ranting, I began to feel the hopelessness, the emptiness again. Something he said told me what it was: the vacuum of lost Faith. At that moment I realized that I knew it was all a myth, with a certainty that ensured that I could never believe again. In a way, that gave me new freedom, the sort of freedom you get when you cut your tether in the endless loneliness of space. I knew then that I could do whatever I had to do.

The Mihdi finished, as usual, by calling on God to strike down all the evil-doers in the Universe. As he said it, my eyes focused on the control panel where I had been staring blankly, and I knew I had the answer. I found my tool bag, and in two hours I had stripped the Sun-fire of everything I needed.

Jeremy came in as the cannibalization was nearly complete. He eyed the warped heat shield I had pulled from the nose. "Hab, you aren't trying to fix this poor melted thing, are you?"

"I'm just removing something we can't use right now anyway."

He looked the damaged ship over, then examined the equipment I had re-

moved. "Yah, I see your point. But why pull it out?"

"I may have found a use for it. Maybe the solution to our problems."

"But how. . . ? a weapon! Don't do it, Hab. It will only get more of your people killed."

"You think I haven't thought of that? Jeremy, one way or another, the ordeal has to end. My people are the walking dead, starting with my father. Yours may be too, unless someone puts a stop to it."

"Killing never puts a stop to anything. It feeds on itself."

"Hatred feeds on itself. I know where the hate is coming from."

"He has over three thousand followers, Hab, and they hate as much as he does."

"They merely disliked until he came along. I have seventeen thousand brothers on this planet, Jeremy. That's about four thousand less than when the Mihdi came here, and the rest are virtual slaves. Now it's going to stop. I know the Shi'ih weakness."

"Oh?"

"How did the Mihdi come to be here?"

"He was exiled."

I nodded. "He was exiled by other ayatullahs who knew he was dangerous. No country on Earth would take him in. He's already had seven of his own top ministers put to death for treason. He doesn't tolerate any challenges to his authority. The Shi'ih's have no leadership in depth."

"They won't need it. If you assassinate him, you'll have a mindless mob killing every infidel in sight."

"Undoubtedly, if I assassinate him.

But what if he were struck down by the Hand of God?"

"You think now you're the Hand of God?"

"I'm betting that if he dropped dead in front of his followers for no apparent cause at just the right moment, then that's what they'd believe. I don't think the other mullas would try to convince them otherwise."

"That, my friend, is the long shot of the century."

"Actually, the long shot of the century is waiting for God to do the job for us."

Jeremy sighed. "No, I think that's a sure thing." I could feel lost faith in his voice, too. "All right, maybe you can pull it off, but are you sure they can't detect it?"

"No, but I know it can be extremely difficult to diagnose as a cause of death, and I don't think we have lab facilities up to the task on Mazra'ih. Besides, the immediate appearance is what will have to do the trick."

Jeremy looked at the floor. "Where does this lead? We're talking about killing here, Hab. If we accept something like this, how long can it be until this planet is just another place for religious wars? How long before we're all doing it?"

I closed my eyes, and I think I let a tear get out. "I see it coming, too. But what if we do nothing, and in a few years there is nobody left but the Holy Savior and his followers? Any way you look at it, history says this planet is headed for trouble."

Jeremy stood in silence, with worry lines growing across his face. Finally he said, "I'm not convinced you can

pull it off, but can you use a bulldozer driver?"

"No, but I could use a library and a car."

The trip to 'Akka was slow. The dirt roads were in terrible condition in places, and I made some wrong turns and had to stop for directions a few times, but I arrived on the outskirts of the town the following afternoon with plenty of time to spare before the traditional mass prayer of the following day. A dozen soldiers were inspecting cars as they entered the gates. One approached mine.

"There is no god but God," he said by way of a challenge.

"Great is the vengeance of God," I replied. It seemed appropriate.

"What is your business in the Holy City?"

"I come to hear the Righteous Master's Friday address," I answered.

He eyed the equipment on the seat beside me. "What is that?"

"Communications equipment, so that my brothers in the camp will not be deprived of even one grain of wisdom from the Holy Savior." So I lied. I had greater sins in mind.

He examined the equipment, opening the service panels and poking at the parts. I hoped he wouldn't break anything. A second soldier came over with a sniffer to check the car for explosives. I was glad I hadn't brought the gun. Finally they let me pass.

The streets of 'Akka were familiar enough, but still it was different from the friendly Capitol my father had brought me to so often. Many of the walls had patched bullet holes and faint brown stains, and banners and posters

proclaimed the Mihdi's reign on every building. I recognized no one, which was a blessing since my only disguise was a hasty shave and Moslem clothing, but it was also very sad. The women all wore their dismal black sacks and veils, and the men wore puritan garb that could almost be called a uniform. I knew the only bright clothing for a hundred kilometers around was in three mass graves on the outskirts of town.

I ate supper at a restaurant across from the Mashriqu'l-Adhkar, which had grown two unsightly minarets since I had seen it last. I studied the plaza where the Mihdi would address the congregation. The Shi'ih's had chosen well. The few windows that faced the square had been bricked up, and a couple of loyal sharpshooters in the minarets could cover the rooftops of most of the town. This was not a good place for an assassination attempt.

But then, I thought, there are windows, and then there are windows. Sometimes you are the most blind when you see only with your eyes. I had watched my father help build the Mashriqu'l-Adhkar. The walls were solid granite and basalt, and not much of an obstacle for my weapon. I stopped by a shop after supper and bought drafting supplies.

At sunset prayer I walked bravely into the temple with the other worshippers. I was shocked by the changes inside. The walls were mirrored, and they reflected into infinity, making the small band of the faithful seem like an endless army. On closer inspection, I saw the mirrors were only metalized film, and the reflections they cast were distorted more and more as they passed into the

distance. I doubted the Mihdi's followers appreciated the significance. A mihrab in the wall the worshippers faced contained a chip of black stone set in silver. This the Mihdi claimed was from the Kaaba in Mecca, carved during his infamous raid on the Great Mosque from the stone set by Abraham and kissed by Muhammad.

I stayed in a corner behind the crowd and carefully imitated their actions. I had seen them pray before, but had never really noticed the subtle little gestures involved in rakatin or realized the practice required to pray with the fluidity of a lifetime of faith. I managed to not be noticed long enough to learn the basics.

After prayer, I slipped into the corridors of the temple to check my plans. As I had feared, the service entrances had been wired for an alarm, but at least the building still had no internal security. I found the room I needed, took measurements, made sure there was available power, and left.

The light was failing as I emerged from the catacombs. I heard cheers from the street and went out to investigate. As I stood in the shadows trying to be inconspicuous, one of the celebrants approached, eyeing me suspiciously. "Why do you not show your joy at our mighty victory?"

I didn't like the sound of it. "What has happened?" I asked without really wanting to know. "Tell me."

"You have not heard? We have defeated a warship sent to attack us by the Zionist-American NSA. Several days ago it launched a missile at us, but the missile was deflected by the Hand of God, and hit the backside of the planet

instead. Our ships hunted down the infidels and vaporized them.”

I felt suddenly weak in the knees, and did the only thing I could think to do in the instant I had. I spun around to face the temple and dropped to my knees as if to pray. Without a word, he did the same, followed by others. Within two minutes the plaza was filled with the sound of prayer chants.

The refugees, the crew, and Jinnah were all dead. I went through the motions of prayer, taking care with each prostration to wipe the tears from my eyes. Had they put up a fight, I wondered, or tried to run? Had my friends simply watched and bowed their heads in submission as the ships approached, knowing there wasn't enough fuel to do more than lose their dignity? Did they die quickly, or was the ship taken apart deck by deck with plasma beams?

I sucked in my emotions as well as I could. Jinnah would not have given up without a fight, I told myself. With his last kilogram of fuel he would have turned the stern of his ship toward his attackers and Puppetered them. It would be a pointless gesture, of course. Unlike the Mihdi's illegally modified ships, Jinnah's freighter was designed for the crowded close Earth orbits where tight-beam exhaust is prohibited. To stop his attackers, he would have had to wait until he was well within the range of their weapons. The lumbering freighter couldn't have turned fast enough to catch them before they fired. How long had he held off, I wondered, before performing his last great act of defiance?

I finally stood, hoping the failing light would hide the grief in my face. I wanted to slip away unnoticed, but the

man who had approached me came back. “Thank you, gracious friend,” he said. “Thank you for reminding me to first give prayer to God for His Greatness in scourging the Universe of the infidel. Instead I vainly celebrated our own little triumph.” He put his hand on my shoulder and pressed a cheek against mine. It was all I could do not to retch.

I once got hit in the face with a cranehook and broke my jaw. It didn't hurt nearly as much as the smile I returned to him. “Time enough for that now, brother,” I answered. “It is the little triumphs that bring us joy. And this is not so little as some, eh?”

He laughed like some damned Barbary pirate and slapped me on my back like a fellow cutthroat, then whirled off into the crowd to celebrate some more.

At my room at the inn I buried my head in the coarse blanket of the cot and cried silently for the thousands of Baha'is who had died at the hands of the one who now proclaimed himself Messiah, the returned Twelfth Imam. I wanted to work up hatred against him to make my task of the following day easier. It wouldn't come, even when I tried to imagine the children of the freighter floating lifeless in the vacuum of the wreck, their eyes bulging and crusted in dry blood, their bodies mummifying as the moisture of life vanished into space. What came instead was guilt. I was coming home when I saw soldiers enter my village. I hid. When I came back to the planet to fight, my little ship had probably given away the freighter. Now, the day before I was to strike back, I had reinforced the faith of these barbarians. I wanted to quit.

That made me feel guiltier. My friends



had asked us to return knowing the risk. They had died for that purpose. I had a responsibility to make their deaths count. I knew I couldn't have been the only one on the planet willing to fight the Shi'ih, but I was probably the only one with a plan that could work and with the opportunity, equipment, and skill to pull it off.

I slept little again that night. When I did, I dreamed I was drifting in a void, and every action I took moved me farther from help. My father kept calling for me to join him, and cast me a rope from out of the blackness. As I pulled myself back, I saw my father in the freighter, and its interior was an inferno. I let go of the rope and woke up again.

The next morning I arrived at a service entrance of the temple in a workman's uniform and presented myself to the guard.

"God is Great."

"Praise be to God," he acknowledged.

"I have satellite communications gear for the address of the Holy Savior," I said, motioning to the bag of gear.

He pulled the bag open with the muzzle of his rifle, peeked inside, then motioned me toward the door. He had no reason for diligence. After all, not even a large bomb could threaten the Sword of Righteousness from inside the great stone building. Besides, the city swarmed with the faithful, and the cowardly infidels hadn't enough competence among them to murder a cow.

I took my bag, sauntered inside with half as much outside confidence as I had inside fears, and wound my way through the corridors to the room I had picked.

I checked my watch. I'm not sure why. I'd checked it just as I drove up. I still had over two hours until the address. I tuned a portable to the local station, stuck it in my ear, and began to set up the equipment.

I wished for a window, but a window would have been my undoing. It was all just a matter of trigonometry and physics, really. I knew my location and that of the pulpit outside, the elevation, the thickness of the walls, their dielectric constant, magnetic permeability, and conductivity . . . it was all just a matter of doing the calculations. I wondered how many of the fundamentalist cretins swarming the city could have done the same. I wondered if my calculations were correct. I wondered if I was doing the right thing while the rest of my people were wrong. I wondered if I still had the right to call them my people.

What I was doing was wrong. It was murder and it was a lie and it was necessary. Or was it? Did I have to kill him? Maybe I could just incapacitate him, but the margin for error would be much smaller, and a live vegetable can be studied indefinitely. I couldn't risk it. Besides, there is no moral difference between killing the whole body and killing the mind.

Those two hours passed more slowly than the days spent in the Sunfire. I checked my equipment, checked my jury-rigged power connections, checked my measurements, and checked my calculations, then did it all over again. With each creak and pop of the building, I jumped. By the time of the address I was a nervous wreck.

Finally, the Holy Savior began to

speak, and time stood still. I was counting on his help in my crime, but the longer I listened, the more changes I began to hear in his pattern. He had to stick to his usual dogma, or my plan would backfire.

I checked the powerful narrow aperture radar again, and brushed my finger across the switch that would turn it

# How you live may save your life.

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The battle isn't over but we are winning.

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on. I wondered again about my power calculations. I needed just barely enough to do the job, aimed at just the right spot on the plaza outside. Two little would simply warm his old bones. Too much, and he would be unmistakably cooked.

At last I heard him use a familiar phrase, and knew the moment was at hand. I swallowed hard, and rested my finger below the switch. "Oh mighty armies of Islam, rise up!" the radio screamed in my ear. "Rise and sing the praises of God!"

The crowd began to chant something unintelligible.

"Oh God, Oh Mighty and Divine Spirit, strike down the wicked infidels. Smite with your righteous wrath the unholy false prophets and their followers . . ."

I flipped the switch, and his speech faltered, then slipped into childish babbling. The last sounds he made were the sound of a robe slipping across a pulpit, then a soft thud.

In the dead silence I could feel his weight crushing down upon me.

My campsite is pleasant enough, considering it is on the far side of the planet from everyone else. There is a marvelous fragrant swamp nearby, full of interesting little organisms that have just about settled down to a balanced routine. I have a case of seed and dried cultures that should upset things for them a bit. The weather here is moderate, and if it shifts, as the weather on Mazra'ih often does, I can move easily enough. The Sunfire is handling much better now, thanks to a large roll of tape and some sheet metal, but it will never visit space again. Nevertheless, it gives

me what I need: freedom, power, and shelter. I have a good stock of food, plenty of gear, and a small hydroponic garden.

I know I can survive here, and I think I can even learn to enjoy it. Perhaps I will become a sort of modern-day Johnny Appleseed, singlehandedly turning a primitive continent into a grand garden. The idea appeals to me a lot more than my recent line of work. It would be better if there were some animals to break the loneliness, perhaps some songbirds, but they could not yet live here. The loneliness does not bother me as much as my miscalculations.

Oh, the old man is dead enough. The Shi'ih buried him with hardly a word and haven't spoken of him since. The killings have stopped too, so that much of my plan worked. They are certain his death was an act of God, but acts of God are subject to different interpretations.

The Shi'ih are still in control, though Mulla Yahya has taken over. He's a nice old fellow, for a Shi'ih, and his preachings have taken on a decidedly Baha'i tone. He wants to re-establish contact with Earth, and says he will give the U.N. authorities appropriate guarantees to make it possible. I give him about a month. I stayed in 'Akka for a week after the assassination, and heard the talk. No one likes to have his beliefs pulled out from under him, even by the Hand of God. They will cling to whatever they can.

That much I expected. My big miscalculation was with the Baha'is. They are joyful over the miracle of their deliverance, and confident that God has

given them a sign. They're starting to get a little obnoxious about it. If they were smart, they'd emphasize their Shi'ih background and start converting their persecutors. I don't know what I've gotten my people into, but I'm powerless to stop it.

I also don't know how long it will be until I can return to civilization. It may be years before I overcome the compelling urge I feel to tell someone what I've done. To do so would risk a holy war. Aside from that, I don't feel like fit company for the good people of this planet. Perhaps, if I can establish enough high-order flora here, they will at least have a place to hide if the need arises. For now I tell my sins to my computer-confessor, to be held in strictest confidence in encoded memory and carried with it to the scrap heap.

The computer is a logical tool, therefore useless to answer my questions. Which is worse, to lose a beautiful faith and know with certainty that it is a fairy tale, to have that faith strengthened and thereby court persecution from others of equal faith, or to have your spiritual leader struck down by God? And how long can any religious colony exist before it falls into a vicious cycle of *jihads*? Once Sol-Bab is repaired and realigned, the stream of refugees from Earth will be renewed. Soon, it will be a flood, for that is the intent of all our labors here. I hope a large population will serve as cover to protect my people and Jeremy's and to keep the predators in check, but at some point will there again be refugees from Mazra'ih to Earth?

And why have I kept the radar unit?



Ian Stewart

# MISSING LINK

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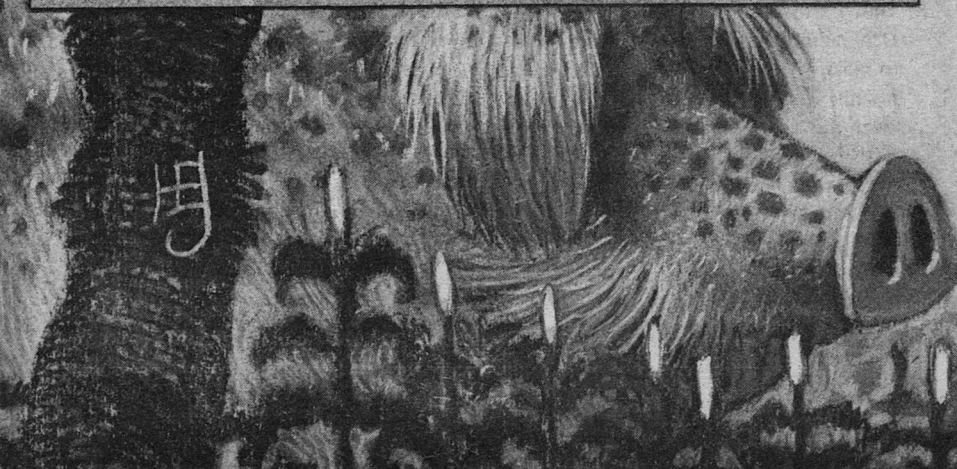
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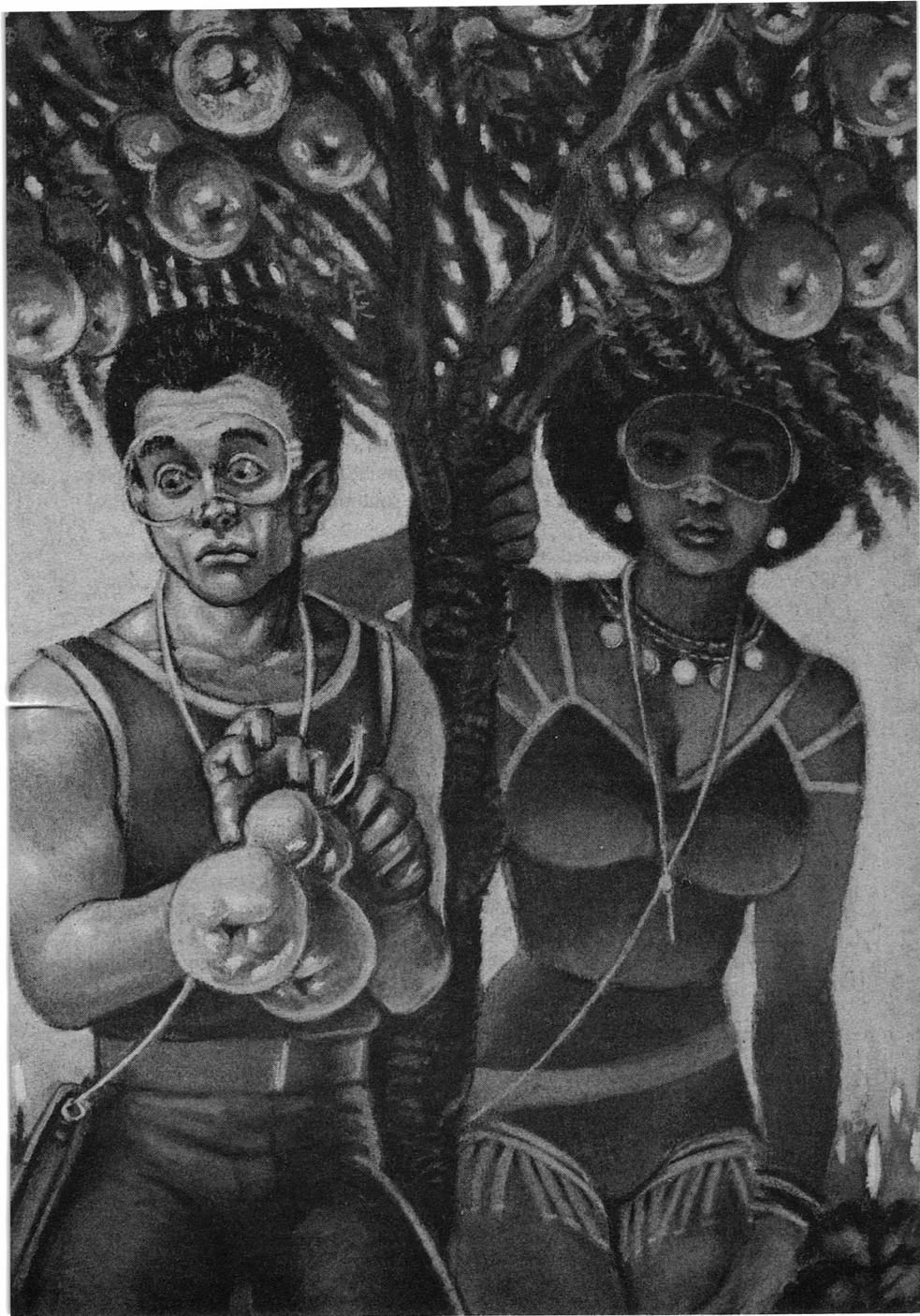
When Billy the Goat  
is in legal  
trouble,  
whom does  
he hire to  
defend him?  
You  
guessed it. . . .

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Hank Jankus





“—whereas the Trustees Publick, in recognizance of those rights conveyed unto the guarantor and his successors in perpetuity in respect of the Vesting Deed, to wit: socage, burgage, lamap-dary, talliage and stallage; waftage and scutage; stannary, figgery, whiffery and lairage, shall by these presents be bound consequent to the constitutional prerogatives of the Acts of Engrossment of 191 Q.C. to make restitution in fee simple, subject to the statutes, ordinances, decrees and promulgations of the intraspecial treaties of the Quaternity, notwithstanding which it is to be held in issuance that, *ejusdem generis*, such damages feasant as shall be invoked in letters patent. . . .”

Belpheobe's voice pattered inexorably onward in hypnodrone mode, as Billy the Joat tried to relax in the shade of a mulotus grove with a glass of eselethe in one hand and a brunette in the other. Wyllam Jarneyvore was studying Law.

Indeed, in scarcely two weeks' time, he was due to put in an appearance as Counsel for the Defence at the Sector Courthouse on Aphélix. The charges were varied, ranging from incitement to Riot and Personal Conspiracy to Contempt of Congressional Procedure and Aggravated Public Disturbance. The Joat had always inclined toward the Law: the job was well-paid, the perks excellent, and the demands placed on the intellect were a mere bagatelle for one possessed of an eidetic memory. Hitherto he had been deterred by the requirements of a modicum of respectability, sound judgement, patience, and good taste—attributes in which he privately would admit he was mildly de-

ficient. A lawyer whose sartorial preferences lean toward ultra-violet dayglo shorts and a T-shirt labeled “A foot-fetishist is someone who took the wrong turning at his mother's knee” is unlikely to attract wealthy clients. Indeed any clients.

But this time matters were different, for the accused was none other than Billy the Joat himself. Ordinarily he would have hired the best legal brain available, but a miscalculated investment in the Möbius Moonlink Tunnel Project had led to a temporary cash-flow problem. Short of pawning his beloved Vishunti KKB space-yacht *Lindilu*, the only solution was to mount his own defense.

The entire business was so unreasonable anyway, a sorry tissue of coincidences and misinterpretations. It was hardly the Joat's fault that a transcription error had occurred in the operating system of the Civic Planning Computer. It was the merest bad luck that it resulted in the mobile entertainment blimp *Follies Betelgeuse* being tethered, not in the precincts of the Xanadu Pleasure Dome, but in the forecourt of the Quaternity Capitol. It was purely a measure of the paucity of architectural imagination that the two buildings bore a superficial resemblance from the air. The management of the blimp, engaging in what they thought was an authorized pre-publicity event, had not intended an invasion of the Chamber of Representatives by a phalanx of ecdysiasts sporting among them clothing barely sufficient to equip a Sindi Doll for the Riviera. By the merest happenstance this unprecedented occurrence coincided with the Quaternity-wide live freewave

broadcast of the Congressional Opening Ceremonies, watched by 63% of the population of the known universe. Poor maintenance was no doubt responsible for the failure of the master cut-off switch. It was admittedly unorthodox parliamentary procedure for a bronzed Betelgeusian beauty to perform an impromptu striptease—especially on the Speaker's Rostrum. The incident had not been improved by the unwary but enthusiastic participation of the entire Conservationist back bench, acting in the unhappy belief that a red light on a holovix camera indicated that it was in a non-functioning state. And it was little comfort that subsequent chemanalysis suggested that their coffee-machine had been spiked with antihibitran, although it did tend to explain their behavior.

But, to pile improbability upon improbability to an extent that would surely stretch the credulity of even the most flexibly-minded citizen, there had been a hardware failure in the optical memobank of the Aphéligian Broadcasting Corporation's main computer. This normally reliable device had mistakenly registered what its addled solitronic circuitry imagined to be a nanosecond power fluctuation, of a type often caused by external tampering. In its dull, unthinking fashion it had hooked into the Constabulary Network, for the sole reason that this was mandatory procedure in genuine cases of unauthorized interference. Said Network, continuing the unhappy saga of ineptitude, thereupon registered what it foolishly took to be a sequence of illicit programming commands. It was understandable that such an artifact would have an unusual

semiotic profile, matching only one entry in police files. And thus arose the final mindboggling circumstance: whose entry might that be but Wyllam Jarneyvore's?

It was pure misfortune that a malfunctioning probe-shield diffuser had permitted the interception of the message in the first place, and Vaffa Varian of the Thriftex Part Mart would have a lot to answer for when he returned from the sudden and unexpected funeral of an elderly maiden aunt somewhere out on the Fringe Reaches. The Joat intended to demonstrate the weakness of the central portion of the so-called "evidence" by providing a penetrating analysis of the fallacy of applying semiotics to cybernetic structures. The remainder was purely circumstantial. In any case, he would prove that he had been in several different places at the time.

The brunette snuggled closer. Her name—more likely, sobriquet—was Delysia Slinque; she was a courtesan from Novi Tahiti, and she was a birthday-present from a satisfied client. She appeared to be highly intelligent as well as decorative, but her professional facade was faultless and the Joat had been unable to penetrate to the real person beneath. Not that the facade lacked its own interest.

The phone chirped. Billy disentangled himself, whistled the headset across from its shelf and thumbed the release button. With his tongue against his teeth he produced several mechanical clicks and buzzes, before speaking in falsetto tones. "Wyllam Jarneyvore's secretary. I regret the Joat is busy at the moment. Who is that speaking? May I take a message?"

“This is Palgandra. You can tell the Joat to stop pretending to be his secretary, and to take his grasping paws off that Novi Tahitian cutie.”

Joze Palgandra was the local Grynth bigwig in the Space Department, and a communication from him always meant trouble. Big trouble. Joat trouble of a personal kind. On the principle of never admitting anything, Billy squeaked “Fortune has smiled on you, kind sir. The Joat does have a few spare moments in his otherwise crowded schedule. Please speak concisely. Putting you through now.” More clicks and buzzes, and then: “Billy the Joat here. Is that Joze Palgandra? Sorry to keep you waiting. A small matter of a consignment of Old Masters for the Lautrec Gallery. What do you wish to discuss?”

“An item of intelligence that appears to concern your good self. One of my colleagues in Police Liaison—a credulous fellow, *totally* unreliable—claims to have traced the purchase of a packet of antihibitran to your sealed account at the Bank of Lucerne in Waldorf Sector.”

“My sealed account? Most perplexing, since I have no such thing. No doubt some confusion with my account at the Louisa May Alcott Memorial Trust.” *Better move it somewhere else*, the Joat thought, though the damage was done now. “Is that all?”

The Grynth emitted a rumbling snort of uninterest and boredom. “Some foolish notion that the packet’s contents can be identified through marked codons in its passive dispersant medium. Utter nonsense of course, and I’m sure that nothing illegal has occurred. However, routine must be adhered to. By the by,

did you know that the maximum penalty for Contempt of Congressional Procedure is thirty years in the skrunt-mines of Job’s Last Hope?”

“Fascinating,” said the Joat wanly. He pulled himself together. Marked codons? How utterly *gauche*. A thought inserted itself in his mind. A thought of double-edge import. He said, “And the *other* purpose to your call?”

“What other purpose?”

“There’s *always* another purpose when you disrupt my peaceful and peaceable existence.”

“We’ll discuss it when you come over,” said Palgandra, and hung up.

Palgandra’s desk was dominated by a mottled purple watermelon. One of its green blotches was marked with a bold red triangle.

“Ankershou,” said the Joat.

“Bless you.”

“The planet on you desk. Ankershou 17/B\*ddJ, Egmont Sector. I was reading about it in *Space-Time* magazine a few months ago.”

The Grynth’s hairy head bobbed, and he grunted noncommittally through an ear-orifice. “No doubt you recall the substance of the article?”

*This interview*, the Joat thought, *is getting off to a bad start. What about antihibitran? Marked codons? Job’s Last Hope?* He dredged his capacious memory, visualized the page, began to read. “Colonized by a Barasshanti expedition forty years ago, but not registered. Colony soon died out, mechanical failure in the food-processor, nothing environmental. Unique in the known universe for its proximity to a twistar sun. Just outside the distortion zone,



avoiding time paradoxes. Only native fauna an animal closely resembling the domestic pig. Rediscovered last year by Femm survey party, who had the sense to register it. Barasshan in an uproar, protest to Supreme Council. Not a chance, serve them right for not registering it themselves in the first place. Meteor-swarm in a teacup, no repercussions bar bruised egos and those are ten a centikroon.”

Palgandra exhaled like a foghorn in mourning for vanished mists. “A masterly summation. I wish it were so.”

“You mean that dump is *important*?”

“Oh, yes.”

The Joat waited, but nothing more was forthcoming. He prodded. “*Why, Joze? What can possibly be important about a mouldy mauve football lousy with porkers? Except as a base for ecologists or twistar scientists, who’d be granted visiting rights anyway under the Mutual Enlightenment Pact of 16 Q.C.—*”  
*Good girl, Belphoebe. I didn’t know I knew that.*

Palgandra’s enormous head drooped a fraction, as if in defeat. “Magneurex.”

“What? The telepathy-drug? But that’s impossible! Magneurex can only be found in the seventh motor ganglion of the blank-faced mockroach, during the pre-mating season, on the seventh moon of the seventh planet of Heptad VII! Everybody knows that!”

“I have no reason to doubt it.”

“And Heptad VII is under Grynth administration, and prohibited to commercial exploitation.”

“Correct,” said Palgandra. “But Ankershou is under neither Grynth administration, nor prohibition.”

“You mean there are blank-faced mockroaches on Ankershou?”

“No. The fruits of the Morecambe bay-tree.”

The Joat’s mind was awl. Ever since the Tulliver Riots it had been the firm policy of the three relatively normal members of the Quaternity—Barasshan, Grynth, and Human—under no circumstances to permit dissemination of a telepathy-drug. The result, they knew, would be social collapse. Societies only work when you *don’t* know what everybody else really thinks about you. But the fourth race, the Femm, didn’t see it that way. Nobody really understood the Femm mentality; and the Femm reciprocated by utterly failing to understand anybody else. Unfortunately they were too powerful to be kicked out of the Quaternity, which is why they had been invited to join it in the first place. Furthermore, magneurex had no effect on Femm physiology. All this went through the Joat’s mind in a flash. He summed up his conclusions in a hal-  
lowed neoZen proverb: “When the exudations of the Garguantuoid encounter the air-conditioner, the prudent man went offworld last week.”

Palgandra nodded his agreement, and essayed a tired smile, managing to look like a self-conscious bloodhound in a gorilla suit. “Of course they don’t admit to it openly, and we don’t have any proof, otherwise we could at least try to bring some diplomatic pressure to bear.” He fiddled distractedly with some papers, then brightened. “Fortunately, I think we have it under control,” he said.

“That’s a relief,” said the Joat. For a wild moment he’d had a horrible feel-

ing that Palgandra was going to try to involve *him* in this hopeless mess. A hiding to nothing, that would be. He pitied the poor sod who got the job of sorting it out. Thank the Wise Weirds of Wymondham, at least *he* could safely . . .

"I've hired you to deal with this little problem," said Palgandra. He waved a sheaf of papers in his hand, as if to emphasize his words. The Joat's mouth opened to protest, until he noticed what was written on the top sheet. *Forensic Laboratories—antihibitran test results*. Below, a pink card protruded, bearing a number that he identified as his own Social Security code. He paused, uncertain how to respond. Palgandra looked him in the eye, and said, "I had Chief Pigge send these over through interdepartmental liaison. He wasn't keen—said they were the only copies. But I don't think there's anything significant in them, do you?" He made as if to discard the papers into a nearby shredder.

The Joat swallowed manfully. "When do I start?"

When Billy arrived home, Delysia had gone out "to stretch her legs," which he felt was a totally unnecessary act. Belpheobe had of necessity remained, being built into the fabric of the house. "Greetings, O Master!" she declaimed as he thumbed the door-plate.

"Shut up and let me in!"

"Your wish, O Wise One, is my command!" The door dilated and the Joat stepped through. He snapped his fingers. "A double Glenfuddle, on the rocks, 'phoebe."

"I hear and I obey, O Illustrious One. Meanwhile—"

"Meanwhile what?" snapped the Joat irritably.

"The Wildfowl Protection Act of 143 Q.C. Be it so enacted in these hallowed precincts—"

"Can it, Belpheobe!"

"—that sundry species of rare bird-life are protected by the Laws of the Quaternity from any form of interference with their habitat, be it inadvertent or by foul design, to wit—"

"Tu whoo."

"Pardon, O Master?"

"Just an owl of protest, Belpheobe. I'm not in the mood for legal studies. Anyway, I don't need to bother now. Out of the *Fieri Facias* into the Case of Thorns."

"But, Master, the program you gave me does not permit me to cease, without an explicit command—"

"Which I've just given you!"

"—and a password, which you have not. Landbirds, seabirds, groundbirds, birds of prey, and any manner of . . ."

The Joat groaned. He'd decided learning the Law might be boring, and had taken steps to ensure that nose and grindstone remained in intimate contact. If he wanted to stop, he had to recall an autohypnotically implanted password that was only accessible if something important came up.

"Very well, Belpheobe. The password is 'cerebrobrach.'"

"—winged creature of birdlike features and demeanor . . ."

"Correction. 'Campanula.'"

". . . Subsection 44(b)(ii). It shall, on penalty of total forfeit of chattels, goods, hereditaments and other sundry possessions, be prohibited to . . ."

*Oh God*. He couldn't remember the

password. His brain didn't think there was a good reason to lower the hypnotic barrier.

Two hours later, the Joat was in an alcoholic stupor, and Belpheobe's voice had gone fuzzy and indistinct:

“Subsubsection 9 36(k)(xviii) (gamma). All species of:

(1) Snow-pigeons;

(b) Rumpled Gallinules;

(c) Flightless groundbirds of all kinds, including Kiwi, Moa, Ostrich, Emu, Hralthfrithian Perspunctiple, Plingent Canunculoid, and all winged but land-bound creatures, denizens of any world within the confines of the Quaternity at large;

(d) The Gauzy Albatross;

(e) The Huge Wren of the Banshee Wyldernessee;

(f) Nestlings of the species *Bureau-cratICA prevaricans irritabilia* of gross displacement no more than the lesser of seventeen standard audubons or . . .”

The voice became even more indistinct, and the Joat dozed.

He was still asleep on Delysia's return, but Belpheobe's customarily flamboyant greeting of visitors and house-guests woke him, and by the time she appeared he had staggered to his feet. The password came unbidden to his mind. “Belpheobe: ‘panpharmicon.’” To which Belpheobe replied that obviously he would not wish his studies to intrude upon a house-guest, so she had ceased on her own initiative. None of which did his head much good.

“I've brought you a parting gift,” said Delysia shyly. Which was odd: nothing shy about *that* lady.

“I though you *were* the gift,” he said lightly.

“Only until tonight,” she replied. “But you may remember me through this.” A bowl of flowering cacti.

“My God,” said the Joat, “Is it Tuesday already? That's very sad.”

“No, sir: it's business,” said Delysia. And burst into tears.

A Joat, by nature, is equipped to deal with virtually any eventuality: a super-fusion reactor gone critical, a Gargantuoid-stampede, a wild galaxy on a gravity-binge. Jack Of All Trades. But comforting a weeping woman wasn't a trade, and it left Jack baffled and uncomfortable. Finally he settled for a brotherly arm around her shoulder. “What's the matter, Delysia?”

“You're sending me away!” And the sobs renewed.

Now that, the Joat felt, was unfair. He hadn't ordered her in the first place, he hadn't asked her to leave, nor did he wish her to. It hadn't occurred to him that the professional training of a Novi Tahitian courtesan would permit her to take any interest in such matters. “I'll never send you away,” he said. It made no sense, but seemed to fit the occasion.

“It's all so *unfair*. I never wanted to be a courtesan anyway! It was my mother's fault!”

The Joat seized the opportunity to divert the subject. “What *did* you want to be?”

“An Infomaniac!” Delysia wailed.

“Coals to Newcastle, dear,” said the Joat, who had misheard. At this, her wails redoubled.

“Just as I'd expect! *Men!* All they think a woman's good for is a tumble in the hay!” The Joat forebore to point

out that she had blamed her mother for her current profession. "I want to be a Cybernetic Polymath, Billy."

"Oh," said the Joat, understanding at last. "An Infomaniac, yes." He coughed. "So what prevents you?"

It all came out in a rush. Her real name wasn't Delysia Slinque, it was Moira Trush. She had been raised on Novi Tahiti by her widowed mother, who could not comprehend why a well-made young lady could seek any career other than the most respectable role of courtesan. Fiddling around with electronics struck her as utterly immoral.

"So why don't you leave, do what you really want?"

"I don't know *how*; I don't have the training; I don't have anyone to help me!"

"You do now," said the Joat, in a moment of decision.

"But I'm under contract!"

"Consider it cancelled," said the Joat.

"It's very easy to say, that—"

Billy took her by the hand. "When I say something, I *mean* it. You now receive your first lesson as a trainee infomaniac." He walked away, propelling her gently but firmly before him.

In the innermost rooms of the sprawling house was the Joat's study: an untidy jumble of books, tapes, and cannibalized equipment. He burrowed in the desk and emerged with a remote terminal. "First we dial up the Employment Register like *this* . . . then we select for Novi Tahiti . . . hmmm, here we go. In the employ of a Madam Goozblinder, yes?"

"That's right! How did you do that? Let me see—"

"All in good time, just keep watching. Your Social Security code is NT-0043-552-2113-078, right?" She nodded. "Good. Now for a more delicate maneuver, get into the legal files, find your contract, deal with it, get out again. Ahhhh, yes, just as I expected."

The screen read: NO ACCESS TO UNAUTHORIZED PERSONNEL.

"And you're authorized?" said Moira hopefully.

"Nope. But I never let that stop me." He rummaged under the desk and emerged with a long flat box, plugged it into the back of the terminal, switched it on, and waited. Seeing Moira was puzzled, he explained "Access decoder. Made it myself. ULSI circuits, ternary firmware, very fast search capability . . . See?"

The screen changed to: OPERATING SYSTEM—QUALIFIED ENGINEERS ONLY.

"You're a qualified engineer?"

"Better! I'm a disqualified Joat! Had an engineer's license once, lost it over some stupid misunderstanding, forget the details now."

Two minutes later he had ferreted out Moira's contract, added a cancellation clause, filed the necessary termination documents, and modified all backup copies to match. Temporarily taking over a section of memory in the communication buffer, he wrote a program which let him leave the system, erased all traces of his intervention, and then erased itself.

"And that," said the Joat, "is that!"

Moira wasn't entirely convinced, but the Joat's confidence was catching. "What do you expect me to do now?"

A leading question on which I shall dissemble. "You become my assistant,

answer the mail, scratch the cat, kick Belpheobe. I cram you with Informatics until it comes out of your ears. Come on, we don't have much time!"

"Time?"

"Before we leave for Ankershou at sunrise tomorrow."

"Time for what?"

"Don't be dense, woman."

"Now, don't forget," warned the Joat. "The Mutual Enlightenment Pact allows access by visiting ecologists and twistologers. So we're a couple of scientists from Harvard Segunda investigating the mating habits of *Pseudoporcus podocarpus* (var. Baldwin)."

Moira nodded hesitantly. "What's that when it's at home?"

"The sole animal life native to Ankershou, resembling the domestic pig. I am professor Bill Yornavour, of the Faculty of Porcine Particulars. You are Moira Trush, my Research Assistant. We are equipped with fake IDs to match our fake egos, a Freudian joke you may dissect at leisure. My wife Hortoonse, who remains on Harvard Segunda, suspects us—with good reason—of indulging in mutual non-academic activities. In the hole are several crates of equipment: familiarize yourself with their contents. Meanwhile I will prepare our documentations for landing, obtain the necessary clearances, and so forth."

"OK," said Moira. She looked out of the upper viewscreen at Ankershou's strange sun, an orange illipsoid tinged with deep blue, which somehow seemed to *writhe*. "I've never seen a star like that before!"

"It's a Penrose twistar," said the Joat. "The farther you get into its photosphere, the faster time passes. But its

magnetic field confines the effect to a zone immediately around the star, so we're safe enough here. Well, to be accurate, time should speed up by about six billionths of a percent at Ankershou's orbital distance. Good job it's not more—it'll take long enough to wade through the bureaucratic mire as it is." In the event, it took two days in a holding orbit before the Femm were convinced of the party's *bona fides*. Eventually Professor Yornavour and his assistant were delivered to an inflatable accomodome on the outskirts of the Femm industrial base on Ankershou. Under the impersonal surveillance of two sonobugs and an optic snoop, they took an early rest in preparation for the activity of the following day.

They were assigned a Femm guide, Jyrryd by name, and provided with an aircar. Professor Yornavour thanked the Femm profusely for these acts of altruism, and silently hoped they wouldn't be too disappointed when the snoop behind the control-panel suffered a nasty power-surge. With Jyrryd at the controls, they headed South in porcine pursuit. The terrain beneath was covered with lush green broad-leafed plants, grove upon grove of Morecambe bay-trees. Large sections were fenced off, and squat Femmish harvesters prowled among them, snipping off branches of globular pink fruit, which hung almost to the ground.

Just before noon they spotted a herd of pigs at a water-hole, and Jyrryd set the machine down nearby with an easy skill. He cut the motor, called through to his superiors to confirm his position, and slumped quietly into his seat as the

Joat administered a shot of amnesia. Later he would be supplied with hypnotically implanted fake memories of the day's events.

"So what do we do?" said Moira. "What are we looking for?"

"Anything that can foul up the Femm drug operation. Chemanalysis of the fruit. Natural pests. Geologic instabilities. Weather-patterns. Maybe we can stimulate planet-wide hurricanes and wreck the crop. Right now, we're groping in the dark." They unloaded their equipment and set to work.

The pigs were much larger than it had appeared from the air; not quite up to hippopotamus standard but running a close second. Pink and podgy with brown splotches, they seemed indifferent to the intrusion, with the innate placidity of the herbivore. But, as the day wore on, they moved closer, evincing a diffident curiosity which became bolder as they decided there was nothing to fear. One nudged up against a barograph, causing it to give a temporary reading of 113 atmospheres. Another sat on a meteorological balloon, which burst with a loud bang. The pigs retreated to a safe distance, but one, braver than his fellows, edged closer again. He was distracted by a large bunch of fruit at snout level, which he began to eat. Moira made a note on her compad. Billy picked a bunch of fruit for testing. The chromatograph said they weren't poisonous. Some were overripe, and sticky juices ran down his fingers. Absent-mindedly, he licked them clean. The juice tasted a bit like raspberries. He continued with the analysis, noting with satisfaction the presence of magneurex precursors.

Whoops. Magneurex wasn't exactly *poisonous*, but . . . possibly licking his fingers had been unwise. His head started to feel funny, sort of expanded. From Moira's direction he could hear snatches of chatter, including some rather explicit references to himself. He looked, but her lips weren't moving. It seemed the magneurex was working. His brain continued to interpret the incoming signals as sound. He caught fragments of her childhood memories, previous assignments. In particular a certain Professor Bodley Spatula, who had a remarkable preference for . . . The Joat blushed, but his embarrassment quickly gave way to amusement. Bodley Spatula was a famous authority on genetic engineering, and the contrast between his public dignity and private tendencies was noteworthy. Then another thought intruded, faint through the mental static. Billy concentrated, focused. It was an irregular murmur, several different thoughts mixed together. The main content appeared to be "oink."

The pigs were natural telepaths.

An unusually loud "oink" made him jump, and he turned to find the boldest of the pigs snuffling at his feet. "No," the message resounded in his mind. "Not natural telepaths. We eat the leaves of the bay-tree. Improve the mind beyond *bay-leaf*. Hey, get it? *Bay-leaf*, belief, good eh?"

*My God! They're intelligent!* the Joat thought.

"No, no, just a mental resonance with your own brain. Borrowing your own intelligence, so to speak. I, Pogsnort, am but a Dumb Beast. Your human brain pigs out what it imagines to

be sapient structure. Pigs out! Oh, I'd slay 'em on Broadway!"

*Just my luck, thought the Joat. A spotty pig that thinks in puns.*

"Do you mind? Those aren't spots, they're porker dots!" There was the sound of manic laughter, and tears came to the pig's eyes.

*And I suppose you came closer to us than the other pigs because you're a little rasher?* the Joat essayed.

The laughter ceased abruptly. "That's not funny, you know. Cuts a bit near the knuckle. Oh, wow, cuts near the knuckle!"

*Do you always think in puns?*

"Look, buster, I hardly *think* at all. All you get from me is a mental skeleton. Not my fault if you choose to flesh it out with dreadful puns. Presumably how you imagine a pig *should* think. Hamming it up. Ha!"

Moira noticed his preoccupation with the pig, and came over. "Billy, it's time we packed up and went back. What are you doing with that pig?" The Joat explained as best he could.

"Yes, I noticed one eating that fruit. I'm surprised, I'd have expected them to root around for fungi and things."

"I do not concern myself with truffles," thought the pig haughtily.

Five days passed, followed the same routine, and without any notable progress. On the sixth, Jyrryd was replaced by one Dyrr, a sour-faced individual who responded, if at all, in monosyllables. Once more they flew out to the pig herds, once more the Joat administered the shot of amnexiax. But this time, as he leaned across to open the door, he found himself looking down

the barrel of a laser pistol. Dyrr had been stuffed with barrier hormones and was resistant to amnesiax.

Cuffed and gagged, Moira and the Joat flew back to the Femm base. All of their possessions, including Billy's wristband remote link to the *Lindilu*, were taken from them. They were thrown into a small bare room, and left.

The next morning, after a day without food and water, six burly Femm guards frog-marched the Joat down a dozen corridors, into a sparsely furnished room. A nasty-looking individual, bearing the insignia of a Field Director and presumably the local panjandrum, sat at an enormous desk. They tied the Joat to a chair facing him. On a table at the side were his and Moira's personal belongings.

The Field Director shuffled through a stack of papers, grunted, and only then looked at the Joat.

"We know who you are," he said. "We know why you're here."

"Of course you do," said the Joat in a puzzled voice. "I'm Billi Yornavour, Professor of Porcine Particulars at Harvard Segunda. I'm here to study *Pseudoporcus*—"

"You are a spy and a saboteur. Your name is Wyllam Jarneyvore, a self-styled Jag-Of-All-Trades. You live on Krover's World and you are a trouble-maguer. You were sent to destroy the makneuregs grop. Your papers were forgeries, kood but not kood enough to fool the Femm. Once our suspicions were aroused it was easy to trace the truth."

"That's ridiculous! I'm no spy! I came here to study the rutting rituals of *Pseudoporcus*! I'm writing a mono-

graph on the relevance of tail torsion to reproductive activity patterns, and I—”

“Is it normal for your egological studies to include administerink amneziags to your kide, and destroyink surveillance egwipment?”

“An unfortunate chapter of accidents and misunderstandings. the amnesiag was intended for immobilizing a specimen of *Pseudoporcus*. I have no knowledge of surveillance equipment, and no interest in it since my motives and actions are as pure as the driven ice-crystals of New Novosibirsk and will withstand the most detailed scrutiny. Your hospitality is sadly lacking, I shall complain to the Scientific Exchange Bureau and demand an apology. My assistant needs food and water. I protest this unwarranted and disgraceful treatment. I—” A guard hit him, twice, across the mouth. He could taste blood.

“We know all about you, Jarneyvove.”

*If that's true, why the interrogation?* thought the Joat, through a wave of pain. *What are they after? Are they just playing games?*

“We know about the agts of sabotage you have perpetrated. You may as well admit to them now, it will save a great deal of trouble.”

“I admit to nothing of the kind,” said the Joat defiantly. “My name is Billi Yornavour, and my sole objective on Ankershou is the study of *Pseudoporcus Podocarpus*.” So that’s what they’re after. They’re worried we’ve already planted something that will destroy the crop, and they want to know what it is.

“A pity,” said the Field Director. “We shall have to find ways to persuade you to change your mind. Oh, nothink

grude, I assure you. Somethink suited to the diknity of your alleged agademig profession. Lance-Executive Dyrr!”

“Sir!”

“Fetch *Professor Yornavour* and his *assistant* some food.”

Dyrr departed, reappearing shortly with a sack. He tipped it out on the floor, revealing a dozen bunches of the fruit of the Morecambe bay-tree.

The Femm grunted in satisfaction. “An interstink plant, *Professor*. Eaten in small quantities it stimulates telepathic processes. It gontains a large qwantity of makneurgs pregursors. If it is eaten rekularly the effegt builds up. You know what happens to an overstimulated telepath?”

*He cracks up*, thought Billy. *The brain can't take the strain*. Something of this must have showed on his face, because the Field Director nodded. “That’s right, *Professor Yornavour*. Of course, you and your gompanion do have a choice. You may elegt instead to starve.” He signaled to the guards. “Take him away!”

Moira’s concern was overshadowed by relief when the guards flung the Joat through the door of their cell. The sack of fruit followed. “What’s that?”

“A trap,” said the Joat, and explained their choice of deaths. “Unless we tell them what sabotage we’ve committed.”

“But we—”

“Can’t do that,” the Joat cut in quickly. He didn’t want the Femm to realize there *was* no sabotage. Only the uncertainty kept himself and Moira alive.

“So what do we do?” said Moira.



“Eat, drink, and be merry,” he replied with false gaiety.

“Huh? But you just said—”

“We’ve got to get our strength up. One meal won’t do much harm. Here: eat!” He popped a fruit into Moira’s mouth, took one himself. They waited. After a while he felt a familiar sensation as his brain seemed to swell inside his head. “Moira?”

“Yes, Billy?” the thought came back.

“The Femm made a mistake. I couldn’t explain it before, but now it’s obvious. We can converse without their bugs picking anything up.”

“But if they use the drug themselves, to listen in?”

“Magneurex doesn’t work on Femm. All we have to do now is exploit that mistake.”

“And how do you propose to do that?”

“I haven’t the foggiest idea.”

They discussed a number of escape plans in turn. The first few ideas were implausible, the subsequent schemes wildly impractical. All foundered on the fact that they were completely alone, and helpless. After three hours the effect of the drug started to wear off.

“Great,” thought the Joat bitterly. “All we have to do is get out of here, deal with the Femm, take care of the magneurex, and go home. Nothing to it.” He grimaced. “Don’t worry, I’ll think of something. We’ll be out of here quicker than a wollagong down a sump-hole.”

“Sure,” came a faint sarcastic thought from Moira. “And if pigs had wings, they’d fly.”

And the whole thing came together

in Billy’s mind like Ankershou’s sun going nova.

Pogsnort lazed in the pale sunshine and chewed bay-fruit contentedly. His dim animal consciousness formed the vague thought that this was the proper life for a pig. He looked across the clearing to where Snert and Wallo were rolling in the dust, and belched happily.

A strange thought inserted itself into his mind. *The feeding is better to the North. Where the buildings are.* He rose uncertainly to his feet. Snert and Wallo also rose. *Come and see,* the intruding thought invited. *Swine, women and song,* the Joat added, remembering the pigs’ fondness for puns.

“Women?” thought Pogsnort.

Sows, the Joat corrected.

“Got sows here. Got food.”

*Not sows like this. Not food like this.*

The Joat sought inspiration. *Rich piggings,* he thought in desperation.

“Ow, wow, rich piggings! That’s a good one!” Pogsnort was interested now. So were the others. Wallo kicked her trotters in delight, Snert tried to tie his tail in a knot. The herd began to move.

Other pigs, attracted by the strange thoughts and the movement of the herd, joined them. Slowly they began to assemble—a dozen, a hundred, a thousand. Soon fifty thousand pigs were converging on the Femm base, in search of rumored rich piggings. The Joat encouraged them with promised delights that grew wilder and wilder, driving the beasts into an anticipatory frenzy. The movement became a rush, then a stampede. By the time the guards decided to believe the evidence of their

own senses, it was too late. The pigs pounded huts and accomodomes into rubble. A small group led by Pogsnort invaded the detention area and smashed every door in sight, inveigled by promises of Hambrosia, the fabled Food of the Hogs. Among those doors was the one that restrained Joat and trainee Infomaniac.

Only one central building remained standing, its inhabitants long fled. To this the Joat made his way, and regained possession of his wristband remote. Within ten minutes they were on their way out of Ankershou's atmosphere. Below, fifty thousand perplexed and disappointed porkers milled aimlessly through the ruins of the Femm base.

They had to move fast before reinforcements arrived. The Joat told Moira to contact her old flame Bodley Spatula by freewave and wheedle from him some limb-grafting gene codes. "Promise anything—you don't have to deliver. Threaten blackmail, if you must." While she exercised her woman's wiles, holding a lengthy and intimate whispered conversation with a person she addressed as "Boddles," the Joat busied himself constructing a large-nozzled spraygun. Moira informed him that Professor Spatula would call back shortly with the required codes and refused to say what she had promised in return. The Joat began construction of a bizarre electronic device like an inside-out free-wave transmitter. When Moira asked about it he told her it was a "photosphere penrotavator." Soon after, Bodley Spatula called back with the information the Joat needed. He promptly disappeared into an isolation cubby with

a box of chemical apparatus and didn't emerge for nine hours.

After that the action, when it came, was over almost before it started. *Lindilu* did a quick sweep of Ankershou's equator while the Joat wielded the spraygun through an open hatch. Then the photosphere penrotavator was activated. As they left the system at top speed something funny seemed to be happening to Ankershou's sun.

A SpaDe cutter picked them up within a day, with orders to return to Aphélix immediately, where a Quaternity Committee of Enquiry was convening to study a complaint from the Femm Phylarchy. To Moira's surprise, the Joat complied at once.

Billy and Moira were whisked through a screaming mob of holovix newscasters and taken to a guarded committee room in the Capitol Building. Along one side of a huge table sat one each of Femm, Barasshan, Human, and Grynth. Their name-plaques declared them to be Representatives Qyddjdjmyllymn Zzyjrlyrl, Melvaun ap-Peeq, Jaklyn McJagger, and Fleumax Symwhorl: the Committee of Enquiry. At the head of the table sat a tall, elderly Femm, presumably the complainant, and Joze Palgandra as Chairman. A legal aide sat on Palgandra's left. Two more sat on the Femm's right.

"This enquiry is convened," said Palgandra, "to examine serious charges. Phylarch Yrjyddyj alleges that you, Wyllam Jarneyvore and Moira Trush, are responsible for the destruction of a Femm agromechanical base, and the temporary halting of production of canned fruit intended as a lunchtime delicacy

for younglings of the third and fourth station in the scholastic indoctrinatoria of Femmish brood-chambers." There was more than a note of sarcasm in his voice, but Yrjyddd remained impassive despite a sigh from McJagger and a snort from Symwhorl.

"Can the Phylarch prove these claims?" asked the Joat.

"That is for this Committee to decide," said Palgandra. "The remains of the base are available for inspection. The Phylarch assures us that he can deposit Femm records showing that there was an agromechanical complex on Ankershou, processing the fruits of the bay-tree for export to the Femm homeworlds. Do you dispute these assertions?"

"No," said the Joat. Zzyjrlyrl gave Yrjyddd a significant and surprised glance.

"Then you admit to the charges?" said Palgandra softly.

"No," said the Joat.

"Mague up your mind," said Zzyjrlyrl.

"I have no knowledge of any of these matters," said the Joat, "so I can neither confirm nor deny them." McJagger had difficulty restraining a snigger. Melvaun ap-Peeq canted his carapace a few degrees, a sign of mildly increased interest, and cracked a kaata-nut loudly.

"There are traffic reports on file to show that the space-yacht *Lindilu*, registered in your name, visited Ankershou," said Palgandra.

"I can produce records of an application by an alleged Professor Billi Yornavour, to visit Angershou," said Yrjyddd. "Retinal scans, also on record, confirm that to be an assumed

name. The person in question has been identified as yourself. Do you now plead guilty as charged?"

"This isn't a Court of Law, Phylarch Yrjyddd," said the Joat.

"That can be arranged if necessary," said Palgandra sharply. He shot the Joat a glance that said it all: *Nice try, but you can't do it this way. You blew it.*

"I do have two requests," said the Joat, "which I believe will resolve this matter once and for all."

"And these are?" interjected Melvaun ap-Peeq quietly.

"First, that the remains of this alleged agromechanical complex be dated by neutron-emission scanning. Second, that a specimen of the native fauna of Ankershou, *Pseudoporcus podocarpus*, be captured and brought before this body."

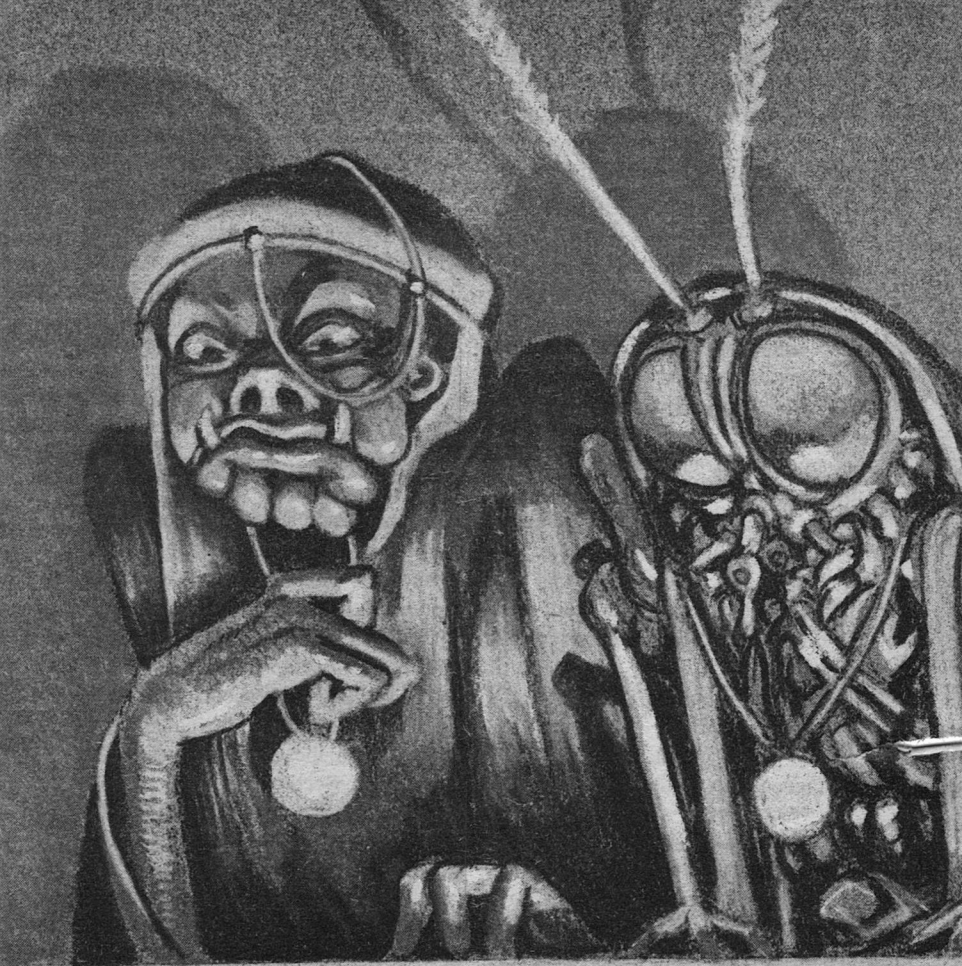
"I fail to see any relevance in this," said the Femm Representative.

"I am entitled to insist that reasonable steps are taken to obtain material evidence, under the Criminal Justice Act of 122 Q.C., Section 36."

Palgandra, who had been in huddled conversation with his aide, came to a conclusion. "I rule that these are reasonable requests," he stated. "Though I hope they are not merely a delaying tactic," he added pointedly.

"Certainly not," protested the Joat indignantly. "I swear it on my mother's grave!"

Palgandra sighed. He knew that Matron Terpsichore Jarneyvore was currently enjoying the best of health. "Very well," he said reluctantly. "We shall dispatch a cruiser at once to Ankershou, with a qualified archaeologist and a zoological team. The meeting is adjourned *sine die*."



Qyddidimyllhynn  
Zziirlyrl

FEMM

MELVAN ap  
PEEQ

BARASSHAN



JAKYN  
JAKER

HUMAN

FIEVMAZ  
SYMWHORL

GRYTH

Much later—by which time the Joat had had a long private meeting with Palgandra—the Committee of Enquiry reconvened.

“And now I hope we can gonglude this matter,” said Yrjyddj. “Do we have the argaeological datink? No doubt it will gonfirm what is obvious at a clance.”

“It does seem to,” said Palgandra. Moira gave Billy an agonized look. “The ruins are approximately seventeen thousand years old.” She gasped. Palgandra placed several holovix stills on the table, adding dryly, “I agree they do appear somewhat ancient.”

Yrjyddj turned the stills one way, then the other. He picked them up and peered underneath. He passed them to Zzyjrlyrl, who went through a similar performance and finally passed them to Melvaun ap-Peeq, who passed them to McJagger, who passed them to Symwhorl, who handed them back to Palgandra, who put them on the table. There was something funny about the remains of the Femm base. The ruins looked much too weathered and ancient to be the result of a pig-stampede the day before. Phylarch Yrjyddj looked as though he had strained at a shrimp and swallowed a porcupine-fish. “But—that cannot be! It’s gwite impossible! There must be a mistague!”

“No mistake.”

“I protest. The evidence has been tampered with.”

“The evidence is as stated. The ruins are seventeen thousand years old,” said Palgandra firmly.

Moira grabbed the Joat’s arm. “But Billy,” she whispered, “they can’t be!”

Yrjyddj recovered most of his aplomb. “I reserve the right to an independent test,” he said. “However, for now I do not gontest the rulink of the chair. It matters little: the important point is the interruption of ganned fruit produgtion.” He glanced contemptuously at the Joat “Deprivink our younklinks of their harmless pleasures, a disgraceful agtion. At best you have achieved a temporary stoppage. Produgtion will resume, whatever the decision of this meetink.”

“I doubt it,” said the Joat. “In fact I predict that you will shortly deny production was ever under way there.”

“Yes, and piks have winks,” muttered the Representative darkly.

The Joat smiled. “Perhaps. May we see the native fauna now?” he asked Palgandra, who nodded.

The captured Ankershou pig was dragged in, with some difficulty, by a squad of SpaDe midshipmen. It looked pretty much like any other hot and annoyed spotted pink pig of hippopotamian proportions, except that, sprouting from its shoulders, was a pair of wings. Their span, half a meter or so, was evidently inadequate for flight. Jaklyn McJagger giggled uncontrollably, Symwhorl’s grin threatened to disconnect his chin from his face, and Melvaun ap-Peeq canted his carapace so far that he nearly fell off his chair, clicking his elbow-joints in delight. With an effort, Zzyjrlyrl remained impassive, and studiously tried to remove a small piece of wax from one ear.

“This is ridigulous,” said the Phylarch Yrjyddj, who was obviously livid. “A jogue in the poorest taste. While I fail to see any material relevance, I ven-

ture to suggest that the winks are some kind of surgigal kraft. A stupid hoagz.”

“No,” said Palgandra. “They’re natural. We’ve done a genescan to check. They’re a mutation that goes back hundreds of generations.” He had the Committee’s full attention, now.

“So, the piks really *do* have winks. So what?”

“It’s very simple,” said the Joat. “Are you familiar with the Wildfowl Protection Act of 143QC?”

There was a muttered conversation with an aide, who fiddled about with a wristcomp before replying. The Phylarch admitted he did have some knowledge of the Act, but indicated his belief that it had no applicability to pigs. “A pik is not a wildfowl,” he stated firmly.

“But if it *were*?” asked Palgandra flatly.

“That is a purely hypothetigal gwestion.”

“Then you may give it a purely hypothetical answer,” said Palgandra. “As an exercise in logic.”

There was another hurried conversation. “I protest,” said Yrjydddj, “the direction this Engwiry is tagink. It has not been proved that the Moregambe bay-tree is part of the habitat of this sordid greature, and even if it were—”

“If it were, then exploitation of the bay-fruit would be prohibited under Law,” the Joat interrupted. “And your alleged production unit would have been illegal. ‘On penalty of total forfeit of chattels, goods, hereditaments, and sundry—’”

“Oh, this is idiotig nonsense. The beast is *not a bird!*”

“But it is,” said the Joat. “A flightless ground-bird.”

“Gonfound it, it’s a pik!” Yrjydddj had lost his temper. “Any fool gan see that!”

“Precisely. Just as any fool can see that a small furry hyrax cannot possibly be related to an enormous leathery elephant. But it is.” He leaned forward to address the Committee. “Classification of living creatures is a very difficult area, your eminences. The Hairy Belmother looks like a bear but is actually a lizard. The Greater Sting Winkle of the Bliny Isthmus is not a shellfish but a fungus. And the Windhoek Amorphozoon defies classification altogether. I could cite a thousand analogous cases”—the Committee drew its collective breath—“but I shall forego them in the interests of speed. The genescan of these so-called ‘pigs’ shows direct avian characteristics.” *Thanks, along with the wings, to the outrageous appetites of Bodley Spatula.*

“But—”

“Moreover,” the Joat continued inexorably. “It would make no difference if they really *were* pigs. The Act says: ‘Landbirds, seabirds, groundbirds, birds of prey, and *any manner of winged creature of birdlike features and demeanour.*’”

The enquiry was adjourned amid uproar.

Billy and Moira sat on a couch watching the holovix newsround. Between advertisements the story emerged. By a six-to-two vote the Committee of Enquiry had adjudged the Ankershou pig to be a species of flightless ground-bird, within the definitions of the Wildfowl Protective Act. If the media had any say in it, the creature would henceforth be

known as *Pigasus*, the mythical winged pig. The Femm Representative on the Committee had predictably dissented. The others were clearly only too happy to take advantage of the loophole to clamp down on the production of "canned fruit," i.e. magneurex. The holovix interviewer did not address the method by which the pigs had acquired wings overnight, having no reason to suspect this to be the case.

"I've got most if it, I think," murmured Moira. "The genetic mutation was triggered by those chemicals you sprayed from that can, synthesized according to the instructions you told me to wheedle out of poor old Boddles."

"You did a good job, there. What *did* you promise him? Do you intend to deliver?"

"A lady keeps her secrets. What I don't see, though, is how there was time for the mutation to take effect."

"But there were seventeen thousand years," said the Joat. "Didn't you listen to the archaeological report?"

"But with my own eyes, I *saw* the ruins made only days ago by a mass of marauding pigs! Today they're ancient and overgrown, and every pig on the planet has suddenly sprouted wings! I just don't get it."

"Ankershou has a twistar sun," said the Joat. "You get time distortions near a Penrose twistar. No trouble at all to speed time up so that seventeen thousand years pass in a few hours. All you

need is to expand the twistar's zone of influence until it extends beyond the planet's orbit, using a—"

"Photosphere penrotavator!"

"Exactly," said the Joat. "To plough up the magnetic field," he added apologetically.

"But what about the Femm at the base? Did they all . . . die?"

"Of course."

"Oh, Billy. You're a mass-murderer and I'm an accomplice."

The Joat hastened to reassure her. "No, no. Not at all. Although to us it took only a fraction of a second, they lived out the fullness of their lives. Though they must have wondered why their communications were disrupted, and why nobody ever came to relieve them. It must have seemed like a monster of a magnetic storm."

"But why have none survived? Didn't they breed?"

"Miracles I achieve daily, but some things are impossible," said the Joat. "How many females did you see on Ankershou?"

"Oh."

"Anyway, a lot of the credit should go to you. It all came together when you made that remark about pigs having wings. I suppose that subconsciously I'd already worked out most of it. And the mutation of our pun-loving porcine pals provided—"

Moira grinned. "The missing link?"



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● Like the bee, we distill poison from honey for our self-defense—what happens to the bee if it uses its sting is well known.

Dag Hammarskjold, *Markings*



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# the reference library

By Tom Easton

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- The Memory of Whiteness**, Kim Stanley Robinson, TOR, \$15.95, 352 pp.
- Lovecraft's Book**, Richard A. Lupoff, Arkham House, \$15.95, 260 pp.
- The Dream Years**, Lisa Goldstein, Bantam, \$14.95, 192 pp.
- Tom O'Bedlam**, Robert Silverberg, Donald I. Fine, Inc., \$16.95, 321 pp.
- Privateers**, Ben Bova, TOR, \$15.95, 384 pp.
- Free Live Free**, Gene Wolfe, TOR, \$16.95, 416 pp.
- Infinity's Web**, Sheila Finch, Bantam, \$2.95, 240 pp.
- The Copy Shop**, Evelyn E. Smith, Doubleday, \$12.95, 179 pp.
- Schismatrix**, Bruce Sterling, Arbor House, \$15.95, 288 pp.
- The 1985 Annual World's Best SF**, Donald A. Wollheim, with Arthur W. Saha, eds., DAW, \$2.95, 302 pp.

With **The Memory of Whiteness**, Kim Stanley Robinson may have written a masterpiece. The book is ambitiously, intricately, and deliberately orchestrated, and philosophical to boot, but it is also highly self-conscious, as if the author himself constantly doubted that he was succeeding at the task he had set himself. As a result, the book is often slow going. Yet I enjoyed it, and I think many of you will too. The book is worth reading precisely because of the size of Robinson's self-imposed task, for it is fascinating to watch his progress.

One of my difficulties with the book is that I am not entirely qualified to judge Robinson's success or failure, at least in one respect. His tale concerns music, and his novel *seems* to be structured like some large piece of music, such as a symphony. I know too little of such things to be sure, but let me tell you something about the story. Then, perhaps, you can decide whether you want to pursue it further.

*Memory's* world is two steps beyond Einstein. Data obtained from an enor-

mous particle accelerator built in space have permitted the final penetration of nature's secrets by Arthur Holywelkin. One result is whitelines, conduits of solar energy direct from the sun to release points called whitsuns. Near the whitsuns orbit the terras, tiny worlds built of asteroids or moons, each equipped with a gravity generator and surrounded by a discontinuity that keeps in an atmosphere. Whitsuns also orbit Mars and Pluto; abundant energy had made possible the dispersal of humanity throughout the solar system. The system's culture is dominated by its heritage of music from before the days of whitsuns and terras, when people rode and lived in claustrophobic, sense-depriving tin cans and music was their salvation.

Near the end of his life, Holywelkin built the Orchestra, a mad melange of musical instruments hung on a single frame and controlled by keyboards. Now, 300 years later, the Orchestra is housed and its Masters are trained on Pluto. The ninth Master is Johannes Wright, and it is time for his Grand Tour of the system, when he takes the Orchestra to terras and worlds from Pluto to Mercury, and beyond. The music he will perform is based on Holywelkin's equations, and he has the thought that it will be the true music of the spheres, rendering perceptible the reality of space and time.

Yet life is hardly so simple. Wright's theme is counterpointed by a conspiracy led by the director of the Holywelkin Institute, a devotee of "metadrama." He is exploiting truth, legend, and illusion to create conditions that will force Wright, whom he hates, to think and respond in specific ways. (In the sixties, they called metadrama "mindf\*\*\*ing.") One truth is that of the Greys, by legend a mystic order which seems to know deterministic truths beyond normal ken,

and he plants signs and clues that lead Wright to a meeting with forces that may or may not be of the Greys. There is a flash of the title's whiteness. Wright's music shows its own mystic powers, stimulating his audiences in unexpected ways, even gifting them with apparent precognition. The people around Wright develop their own related themes, orbiting his, pursuing the metadramatists' counterpoint, resolving toward independence. And the symphony's final movement ends the story with an explosion of whiteness that does nothing to resolve the central issue of determinism versus free will.

In *Memory*, Robinson's intricate plot is all. Most of his characters are just real enough to carry their own weight. The premises are, at least to some extent, absurd. The point of the book is what he does with it all, and in that way Robinson here reminds me strongly of Jack Vance (he even gives Vance explicit homage when he mentions a Vance aeolia, a building which catches the wind to play random tunes). The style is also reminiscent of Vance, slightly in Robinson's coinings of names, less in his descriptions, most in its richness of texture and in its apparent arbitrariness of motive and action. As with Vance, everything is drama, and that of course is a strong part of *Memory's* structure.

If you are a fan of music, of Vance, of intricately recomplcated tales, you will love Robinson's novel. If you prefer action, simplicity, directness, you will not. Be warned.

In the late 1920s, according to Richard A. Lupoff, German propagandist George Sylvester Viereck asked Howard P. Lovecraft to write an American *Mein Kampf*. In return, Viereck would (maybe) publish a book of Lovecraft's stories and so satisfy his fondest wish.

The scenario is not quite as unlikely as it sounds. Lovecraft was of old New England stock, eminently respectable, and so eminently suitable to Viereck's wish for a stalking-horse above reproach or suspicion. Lovecraft was also a racist by today's standards, sure that Slavs, Jews, and Italians were polluting the pure blood of the real America. He was thus eminently recruitable.

But Lovecraft was also an intelligent man and a patriot. As Lupoff shows us in **Lovecraft's Book**, he eventually realized just what he was getting into, with proddings from Sonia, his estranged wife; Theo Weiss (Hardeen the Mysterious), brother to the late Houdini (for whom Lovecraft had ghosted a story); and other friends. We meet Frank Belknap Long, Vincent Starrett, Clark Ashton Smith, Robert E. Howard, and more, all at their most dramatic. We follow a tangled conspiracy worthy of the old pulps as the German plot is revealed, a plan to use undersea submarine bases in America's harbors to mount an invasion force aided by sympathizers and traitors ashore. We marvel as the gangsters of the Prohibition Era enter the fray on the side of right and justice. We gasp in awe as Lovecraft turns the events of his recent life into one of his best known tales.

And we cry: *C'mon now!* Lovecraft was a recluse! He would never have gotten involved in an espionage adventure, no matter how seductive the circumstances. He would never have punched out a traitor, or been kidnapped with his wife into a submarine prison, or been beaten by German thugs. He *might* have asked his many correspondents for what they knew of the various hate-mongering groups, from the Klan to the Friends of the New Germany. But the rest? Surely Lupoff has, tongue firmly in cheek, recreated with utmost

skill the ambience of the pre-depression pulps with the added fillip of making his characters people we all know and love. He gives us a lovely feel for the time, and for Lovecraft himself, but what he has written has to be a novel, not biography.

Doesn't it?

So call it a novel. Call it, even, SF for its use of our people, for its incidental gimmicks such as the night-vision "noctovisor," and for its essential nature as an alternate-world story. Call it good, and let me go add its name to the list of Nebula Recommendations.

Lisa Goldstein made an impressive debut with her first novel, *The Red Magician*. Now she does nearly as good a job with her second, **The Dream Years**. Like Lupoff, she has centered her tale on historical characters who, though they are not directly related to science fiction or fantasy, can be linked to our field. They are the surrealists of the 1920s, and it may not be unreasonable to claim that they had a great deal to do with the birth of at least some kinds of SF&F.

She gives us the fraction of cafe-Bohemian Paris dominated by André Breton and his circle as they outrage the bourgeoisie with their manifestoes and pranks. She gives us the would-be novelist Robert St. Onge, less than wholly satisfied with his surrealist friends, who meets a strange girl and follows her across a shifting landscape into the Paris of May 1968 and a long-delayed surrealist revolution. (The mode of time travel seems to owe something to Zelazny's Amber tales.) He experiences the defeat of surrealism, flees a mechanical monster, is snatched into a further future where a mechanical voice tries to brainwash him into conventionality, and finds a second, more suc-

successful surrealist revolution before returning to his own time and destiny. He even finds love, though he surrenders it to the dream of perfect impermanence.

If events don't always make perfect sense, that is clearly because Goldstein is herself—at least for the purposes of the novel—a surrealist, and a more convincing one than many other writers have managed. She is charmingly provocative, and her book is quite enjoyable.

The background for Robert Silverberg's latest, **Tom O'Bedlam**, is an America fragmented into dozens of isolated principalities in the aftermath of a war that left the mid-section of North America devastated by radioactive dust. The West Coast is relatively intact, however, and that is where the story happens. Tom O'Bedlam is a wandering bum who has, ever since his birth on the fringes of the radioactive lands, seen visions of other worlds. He adopted the name and style of a lunatic as protective coloration, but now he enters a time when he must come out into the open.

Once, some years before, Tom was staying with a Brazilian cab driver in San Diego. Telepathically infected with Tom's visions, Senhor Papamacer founded a religion that promoted the idea that the gods would soon come to Earth to save everyone. As the visions spread, the movement gains strength; and as the novel opens, the believers in tumbonde are mounting a procession northward, to the site where the alien gods will arrive. Meanwhile, Silverberg shows us a clinic in the Mendocino woods, where therapists electronically pick the memories from the brains of criminals and sufferers from the atomic disease of the times, Gelbard's syndrome. There patients and staff alike are

having the visions, and the staff, doing their best to track down the cause, learn that one vision closely matches the world of Proxima Centauri just reported on by an old star probe.

Tom, traveling with a band of brigands, eventually reaches the clinic himself. There he reveals that his madness is in fact only pretense and begins to sense that his destiny is upon him. The tumbonde gods will not come to Earth. Rather, it is Tom's mission to help all who wish to make the Crossing to the worlds of his visions, exchanging their human bodies for new, alien ones as they transmit their psyches to the stars. The story's climax, when Tom, the clinic, and the tumbonde horde come together at last and the Crossing begins, is thoroughly apocalyptic and a fitting conclusion to a yarn that fits neatly into the millennial subgenre that I expect to proliferate over the next 15 years.

*Tom O'Bedlam* is an enjoyable tale, well told and well peopled, but I do not think it one of Silverberg's best works. The greatest problem may be that it simply owes too much to the contemporary folklore of space aliens.

More and more, Ben Bova's stories remind me of Poul Anderson's. The latest such is **Privateers**, which echoes strongly of *Star Fox*. The resemblance is far from total, however, for though Bova has a hero acting as a pirate, the circumstances, the issues, and the consequences are his own.

In Bova's future, premised on the nightmares that must have plagued him when he was writing his *Star Wars* book, the US has let the Soviets build an orbital defense first. As a result, it was forced to bow to Soviet demands for disarmament, abdicate space entirely, and let the USSR get the UN license to mine the Moon. Yet not all

US citizens took the defeat of dreams quietly. Astronaut and capitalist Dan Randolph moved to Venezuela and set up his own space center and orbital industrial facility. Similar capitalists have established national toeholds in space for Zaire, Japan, and a few other nations. Yet the Soviets dominate all. They have the lasers that can shoot down anything. They also have the monopoly on lunar ores and can charge what they like, and they do, aiming to force everyone else out of space.

Randolph's solution is to mount an expedition to capture an asteroid, to bypass the Moon and the Soviet monopoly. But the ironically wicked monopolists capture the ship and samples and jail the crew for trial as pirates. Randolph leads a mission to free them and then undertakes to hijack the Soviet ore carriers—for though the Soviets own the right to mine the Moon, they do not own the ore; that belongs to all mankind.

The Soviets are outraged, especially since the other space groups begin to imitate Randolph's success, especially since Randolph has seduced and besmitten the Soviet space chief, Malik's, Venezuelan fiancée, especially since Randolph loves to rub Malik's nose in every insult. The Soviet response is predictably violent. Its defeat, on the other hand, seems highly unlikely. It doesn't hurt when Randolph gets the girl, but when the Third World and the free spacers unite to force the Soviets to eat crow, and the future seems suddenly more promising, I catch a strong whiff of pollyanna.

The book is a novel, yes, and an excellent one, a good yarn and a thrilling adventure. But it is far more a cautionary tale, intended to sway the public's supposed mind in favor of a technophilic future. And it has the faults of such

propaganda tales, which too often force their stories to bow to their messages. This is most blatant on page 292, where Bova has Randolph step egregiously out of character.

On the other hand, what Bova cautions us against seems all too possible. Read the book, consider that his premise is not so easily escapable, and weep.

Gene Wolfe's **Free Live Free** is a marvelously, rompingly unlikely yarn, a thorough delight, flawed only by an ending that, because it fails to emerge from the conditions of the story itself, seems hastily cobbled together to draw the job to a close. I say "seems" because the ending does support Wolfe's comments on the value of dreams.

However, even though I did not find the ending satisfying, getting there was well worth the trip. *Free* begins in the house of Ben Free, an impoverished recluse whose dilapidated house is about to be torn down to make way for an expressway. With Free are four oddly assorted strangers who, in answer to his ad, have moved in, rent free, to help him try to save the house. Candy Garth is an overweight prostitute. Madame Serpentina is a Gypsy witch. Ozzie Barnes is a salesman of neither talent nor confidence. Jim Stubb is a private eye of more dreams than success. To each, Free confides that in his house is hidden a key to "the High Country," his homeland. Each takes the key to be something different in the way of wealth or knowledge. But, when the wreckers come despite their antic tactics and Free disappears, they band together to do what they can to find the secret. The answer, when it finds them, proves to involve a recurring dream of SF. It falls flat because rather than foreshadow it effectively, Wolfe chose to misdirect his readers as powerfully as he could.

*Free's* strength lies in Wolfe's characters. We see little of Free himself, but the quartet of seekers is strongly drawn. We see the human side of each, weaknesses and foibles and strengths together. The bit players tend to be stereotyped, but among them is one who will become a favorite of every reader: Mrs. Baker is a batty murderess of the King's English who reminds strongly of Cleveland Amory's late wife, Jane, that infamous radio jape. She—and others—make me wish that other writers could be half so original in their spear-carriers. If they were, plot could be a very secondary feature of fiction, and no one would mind a bit.

Have I pegged Jane Amory aright? I think so, but sometimes memory wavers. For instance, at last February's Boskone, I met a pair of experienced and lovely ladies who giggled and said they would soon have a book out under the pseudonym of "Sheila Finch." However, I didn't take notes, and maybe they said another name. Maybe they even told me to keep my mouth shut about who is behind the name, but that's all right, since I've forgotten.

At any rate, the book is **Infinity's Web**, and its worst problem is that it keeps going out of focus. The premises are the "many worlds" idea of quantum physics, which gives a "reality" that is an infinity of parallel timelines, each one stemming from some choice point, significant or no; and the idea that only some cosmic observer gives reality its being. Finch dramatizes these ideas by giving us several versions of Anastasia Valerie Stein. There is Ann, depressed wife and mother, afflicted by intimations of multifolded identity; Stacey, a hippy out of her time; Tasha, a professional witch in an England ruled by the Empire that emerged from a successful

Third Reich; and more. Each one has encounters with the ideas of Finch's premise, and the story tracks their movement to a realization of the true nature of reality, aided by a mechanism that reminds me strongly of Benford's *Timescape*.

I have my troubles swallowing any offspring of the Nazis that sounds more like the Weimar Republic than Hell, but leave that be. It's an alternate world, after all. Finch's accomplishment is her (their?) multiple development of a single character as they examine the person Anastasia Stein might have become if she had made various choices in her life and her resolution of all the differences within the bounds of a single multipotent personality.

Evenlyn e. Smith's **The Copy Shop** is a heavily ironic novel of New York and New Yorkers. Its protagonist is Ted Bogard, a writer whose mother collected elderly husbands and "uncles"; when they died, she kept them alive in name for the sake of their pensions. Ted, stuck with this ingenious scam when Mother went away and (supposedly) died herself, must dress up as each pensioner in turn to make necessary public appearances; occasionally, he must even dress as his mother. This puts a perfectly natural crimp in his social life, but he manages quite nicely. Never married, he maintains a sequence of mistresses in a safe house in the Village while keeping his permanent home in an uptown apartment building.

Trouble strikes when his uptown neighbors begin to disappear. One is found half-eaten in a subway tunnel. Pocket change and trinkets belonging to others show up nearby. A cop begins to nose around poor Ted, and a young female journalist pursues him, anxious for the whole story. Ted himself learns

the truth when the ghost of his late Daddy materializes in his apartment and speaks to him via his computer. Daddy, you see, is one of a corps of aliens who brought humanity's ancestors to Earth as tools to change the planet to suit future tenants who prefer a radioactive, polluted home. Every so often, the aliens mignle with their stock, just to make their tools a little more apt for the job at hand. Of course, Daddy and his buddies also view humans as food stock, and that explains the disappearances. Why have all the deaths been in Ted's neighborhood? Daddy wants to be close to his son, and he's been picking on Ted's enemies, or at least his "un-friends." He would *never* eat Ted—unless no one else was around.

The copy shop of the title crops up several times. Why is not clear until near the end of the novel, when Smith reveals that Ted is not the only hybrid around. She doesn't come right out and say it, but she does plant clues that suggest that the female reporter is one, and Ted will, with her, do his bit to improve the breed.

Smith's irony is witty and absurd. I found the book deliciously funny despite the lack of conventional plot and action. The flat, anticlimactic ending, clearly deliberate, fits the author's approach to her tale and to the New York experience. Recommended.

With **Schismatrix**, Bruce Sterling completes the vision of the future of the solar system he has been piecing out so deftly in such novelettes as "Cicada Queen" and "Swarm." Unfortunately, though his imagination is as fertile as ever, he lacks the stamina for a novel.

With his hero, Abelard Lindsay, Sterling spans the history of an age. Lindsay, born in a habitat orbiting the Moon, was trained in the arts of diplomatic

duplicity by the biotechnical "Shapers," at constant, rivalrous war with the machine-oriented "Mechs" for the hearts, minds, and bodies of a space-dwelling humanity (Earth is a relic of the past). Banished from his home for plotting against the status quo, Lindsay uses his skills to prosper in an ecologically wrecked second habitat. He takes up with pirates, raids a Shaper outpost, shifts his loyalties, sells the wreckage of the outpost as art to the alien Investors, packrat merchants, and gains a wife. With skills, clan, and alien clout, he then maneuvers to a position of power in Shaper circles, and loses it all in a change in the political climate. Physically rejuvenated, he finds a way to rebuild his power and influence, and when he loses that, he starts over once again. Always he rides the crest of a wave of social and technological change. In time, when the aftermath of a duel with an old foe costs him his ability to lie convincingly, he becomes less of a dilettante hanger-on and more of a leader. Still, he remains likely to duck out at moments of crisis. He is not the most admirable of heroes.

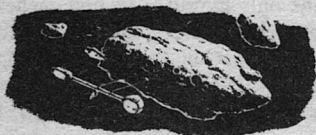
I enjoy Sterling's vision of a humanity splitting into a matrix of possibilities, factions multiplying and diverging along the various paths opened by physical and biological technology. As he says, when a species enters a new environment, it undergoes an adaptive radiation, bursting "into a joyous wave of daughter species, of hopeful monsters that rendered their ancestors obsolete," not all of them destined to survive. Yet *Schismatrix* does not have the unified feel of a novel, partly because Sterling too obviously manipulates his hero in and out of trouble. Furthermore, the book degenerates toward the end into a sequence of more or less loosely con-

nected episodes. Sterling loses his momentum, and his story suffers.

Let me note that part of Sterling's problem seems common to writers who attempt to capture the destiny of the species on paper. They tell a genuine and moving tale at first, but as they get into the destiny part of their story, their works begin to sound more like philosophical tracts. I hope that now, with this vision behind him, Sterling will be able to move on to others. He has the skill to succeed grandly, but to do so with a novel, he will have to narrow his focus a little.

Fourth and last of this year's Bests is DAW's **The 1985 Annual World's Best SF**, and the overlap is striking. Wollheim introduces his book with a discussion of a Soviet survey of Amer-

ican and Soviet SF writers that asked about the social mission of SF. Then he gives us John Dalmás's "The Picture Man," also in the Pournelle volume; Lucius Shepard's "Salvador," also in the Dozois; John Varley's "Press Enter," in both the Carr and the Dozois; George Alec Effinger's "The Aliens Who Knew, I Mean, *Everything*," in the Carr; and Octavia Butler's "Bloodchild," again in both the Carr and the Dozois. Wollheim alone gives us Connie Willis's weak "Cash Crop"; Ian Watson's "We Remember Babylon," for which I don't much care; Stephen R. Donaldson's clichéd "What Makes Us Human"; Gary W. Shockley's overly cute "The Coming of the Goonga" (which was in Carr's "Recommended Reading" list); and Tanith Lee's unsatisfying "Medra." This one is easily the weakest of the lot. Pass it up. ■



● To suggest that mankind will ever be able to colonize other planets or bring iron or gold from them to the Earth is irresponsible talk as compared to the promises of Columbus to enrich the Spanish Crown with gold and spices. The cost of transporting materials of machinery over interplanetary distances makes plans of economic (or military) use of cosmic bodies preposterous.

E. Rabinowitch, Editor  
*Bulletin of The Atomic Scientists*

Submitted by G. Harry Stine



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# brass tacks

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Dear Dr. Schmidt:

Eric G. Iverson's "The R Strain," which concerns the development of a kosher pig, seems prophetic. On November 13, 1984, AP released a story about the babirusa, an Indonesian pig, which supposedly chewed a cud. Combining this characteristic with its cloven hoofs, it led the U.S. Agency for International Development to intimate in one of its publications that at last a kosher pig was found. The kosher pig, or Hallal pig as the Moslems would say, was to be a Godsend of luscious, nourishing protein among the Third World Moslem poor.

I tried to get AP to release my repudiation of this error. After all, I wrote the publication *The Behavior of the Babirusa in the Togian Islands* (published by the Berlin Zoo in 1983), and have probably spent more time observing the babirusa than any human alive. It does NOT chew a cud. Its stomach is rather hourglass shaped and its lysozymes a bit more effective with cellulose than ordinary domestic pigs. That is where the notion appears to have sprung from.

Where Iverson's imaginative piece seems to go astray to me is when it implies that herbivorous hoofed animals which chew a cud are more efficient converters of feed to meat than the omnivorous pigs. The pig, domestic and as is, is the most efficient converter of feed to meat of any stock animal. The least is the beef cattle with about a 15% rate. The pig is over twice as efficient and outdoes sheep and goats as well.

"The R Strain" concludes with a bit about the R Strain pig not meeting biblical requirements as a pig because it is infertile with its own kind, other pigs, and thus is not a real pig. Well, the taxonomists have divided the pigs of the world into five genera. Generally speaking, these pigs are all fertile within their

own genera. However, they are infertile with other genera. Thus warthogs, bush pigs, giant forest hogs, the Sus group, and the babirusa can only produce within their own group. They are infertile with other genera, and yet, all are *bona fide* pigs.

I find "The R Strain" ingenious, falling into the category of "Why hasn't someone thought of that before?"

VICTORIA J. SELMIER

San Francisco, CA  
The author replies . . .

Dear Stan,

I have several problems with Victoria Selmier's letter on "The R Strain."

First of course, as you know, the story has no connection with the AP release on the babirusa, because I wrote it several months before you sent me a copy of that release. The genesis of "The R Strain" was, I fear, much more mundane. I got the idea just after eating a breakfast of sausage and eggs (I fear I'm not a very observant Jew). I happened to think, "Well, what if . . . ?" and the story followed very shortly.

The second problem is partly my fault. I envisioned the R strain's digestive system as being able to do everything an unmodified pig's could, and also being able to handle cellulose, which would make it a more efficient food processor than an unmodified pig. I can see how Ms. Selmier would have taken the comparison to be between pigs and present ruminants, however, so I should have made myself clearer.

Finally, no genus of unmodified pigs (including, as Ms. Selmier makes clear, the babirusa) is kosher, because no unmodified pigs chew their cuds. If an animal meets all the other criteria for kosher status and can't interbreed with any pigs, then I submit that critter is kosher, or at least may be. I'm not theologian enough to be sure, but I think

a lovely brouhaha would spring up over the question—as it has, over the story. Whee! What fun!

Dear Stan:

I'm doing something typical of *Analog* readers: writing a letter to the editor before reading the fiction. Like most readers, I look into your Editorial and Brass Tacks before anything else.

Regarding "The Need to Believe": How many failures should we witness before we conclude that the subject matter of parapsychology does not exist? I'm prepared to be generous, but after more than thirty years of watching and waiting (and even participating in some of the experiments, as a referee) I have yet to see any successful demonstration of any parapsychological phenomenon. The experimenters always say, "Gee, it worked fine yesterday," or "The vibrations here are negative." How long would you accept such excuses from a physics student?

As for the letters concerning my Guest Editorial, "Freedom From Fear":

Ms. Sher doesn't quite seem to grasp the point I was trying to make. I don't *advocate* having a nuclear war to prove that we need a strategic defense against nuclear attack; I fear that people like Ms. Sher won't see the need for such defense unless (or until) a nuclear war breaks out. Then, like their grandmothers and grandfathers did in 1941, they will loudly scream that "the government has left us defenseless."

And like many critics of strategic defense, Ms. Sher is looking at yesterday's technology to judge tomorrow's possibilities. The computers being used on the space shuttle, alas, represent twenty-year-old technology. Computers available today are much better, and those that will be "on-line" later in this decade will be very smart indeed. Tech-

nology does not stand still, the way some political attitudes do.

As for Mr. Landis's comments, I regret that he did not include in his list of references any of Gen. Daniel Graham's writings about strategic defense, or my own book on the subject, *Assured Survival*. The so-called unbiased academics, including Prof. Bethe and Mr. Garwin, have used false statistics, ludicrously pessimistic assumptions, and outright absurdities in their criticisms of strategic defense.

I agree with Mr. Landis's criteria: a satisfactory strategic defense should be cheaper than the attacking force; it should be strong enough to discourage the enemy from launching any attack; and it should use non-nuclear weaponry. His analysis of these criteria, however, falls far short of the mark. Perhaps he doesn't think western civilization, or all human life on Earth, is worth as much as we spend on a ballistic missile submarine fleet. But I do.

As any reader of my 1976 novel, *Millennium*, knows, I have been thinking about the pros and cons of strategic defense for many years. I have not formed my conclusions before testing my assumptions and examining all the available information. I believe that a workable strategic defense is technically feasible and politically desirable. It is also a step toward an effective world government—but that's another matter.

BEN BOVA

*No number of failures is sufficient to conclude with absolute certainty that the subject matter does not exist—though an ever-growing number of failures to observe does justify an increasing doubt asymptotically approaching certainty. But asymptotic means it never quite gets there, and the possibility remains that an effect exists which no one has yet learned to observe properly. Lots of*

*somewhat similar examples come to mind from far better established branches of science. Neutrinos, for example, are very hard to detect, but hardly anybody still seriously doubts their reality. I believe it was Count Rumford who concluded that heat was not a substance because he couldn't detect a mass increase when matter was heated; relativity now shows that there is a mass increase, but not of a magnitude that his instruments could detect. And you could easily watch a sizable region of sky for over thirty years without ever seeing a star explode, but that wouldn't prove that supernovas never happen.*

---

Dear Sir,

Yesterday was a slow day at work so I read your June issue. Last night was even slower so I watched part II of *Space*, the mini-series. Somewhere between realizing Michael York has become a James Mason clone and being tempted to try the newest, sugar substituted carbonated beverage, my day's activities created a smallish thought.

Having read parts of your magazine (mostly short stories) for the last few years I have been exposed to the question often raised in some issues. Being: how, why, and when to separate and distinguish between science fiction and fantasy. The participants of these discussions present solid, though often uninteresting, views which tend to divide them into two camps: those who believe science fiction is only science fiction when it is based on fast and hard science fact, opposed by those who offer the more loosely based "anything goes" approach. Since I read science fiction purely for its entertainment value, I am not a hardcore fan and these arguments meant little to me other than to offer a glimpse of what your magazine would

present in the future. I gave no thought to the question until last night.

It occurs to me there are really three genres. In one, popularly called science fiction and defended by the technocrats and hardwareites, the author takes current technology and problems, mentally evolves them into the future, and weaves a story hoping someday someone will say, "So-and-so wrote about that twenty years ago, isn't he clever." While this type of writing requires imagination, the stories themselves, regardless of how well written, are sometimes contrived and tedious. For sake of clarity, let's call this type of work "prediction fiction." The next type is, thankfully, exactly what the name implies, fantasy. Fantasy comes straight from the imagination; it doesn't matter a whit if the creature couldn't really exist in that atmosphere and gravity so long as it's scary or entertaining. Finally there's what used to be called science fiction by the masses—those Buck Rogers, Flash Gordon, and John Carter adventures, epic struggles of good and evil set against a backdrop of the future or distant worlds. Granted, even the mass market is too sophisticated today for straight doses of this type, but the vast popularity of *Star Wars*, *Battlestar Galactica*, and *Star Trek* demonstrates that people will overlook anachronisms and physical impossibilities for the sake of an exciting story.

There's room for all types of science fiction in your publication. While I enjoy a good piece of "prediction" fiction as much as the next, I would hate to see you exclude any good story simply because it wouldn't hold water at the next international meeting of alienologists.

J. STEPHEN PEEK

Cedar Hill, TX

*I recall Poul Anderson remarking at an Apollo 17 party that the most fan-*

*tastic kind of fantasy, in the long run, may be what's commonly thought of as the most meticulously "hard" science fiction. After all, what could be purer fantasy than the assumption that we already know all the basics?*

*I usually try to make Analog a home for stories which could happen, but that certainly doesn't have to constrict the imagination. The whole point of it is that an enormous range of highly fantastic things are actually possible in this universe, and there's something special about a speculation which is both fantastic and plausible. And since it's highly doubtful that we already know all the principles, writers are perfectly free to invent new ones, as long as they don't contradict anything already confirmed by experiment.*

Dear Editor,

I like *Between the Strokes of Night* by Charles Sheffield but it seems to me he has his weather a bit mixed up—he pictures the temperature high and the humidity near 100% at Christchurch, yet the river dry and a lack of rainfall. This is contradictory. Water is the element that stabilizes the temperature of the atmosphere on earth from day to night, but it does it by the change of state from liquid to vapor and back again. If you have a relatively high temperature and high humidity then you must have precipitation. A desert climate, with no rainfall or humidity, has relatively large variations in temperature from day to night. A climate with large bodies of water around, and a high energy input from the sun, has high humidity and much more precipitation. In my experience some places, such as the Gulf coast of Mississippi, during the summer time have high humidity and daily rainstorms in the afternoon. There afternoon rainstorms would seem to be

a consequence of the reduced energy input from the sun and the consequent cooling and condensation of some of the moisture in the air, then the release of energy to the air and a stabilization of the air temperature.

The natural consequence of any increased greenhouse effect, or increased solar radiation, would certainly be to change climatic patterns. However, this increased energy would cause more storms and on a worldwide basis greater precipitation—not a drying up of the world. It's the energy from the sun that drives our storms. The polar regions where there is very little solar radiation are the areas of lowest precipitation, and the equatorial regions are where the rainfall is greatest. It's on this basis that I object to writers picturing the effects of a hotter sun or increased greenhouse effect causing widespread drought.

VICTOR HATCH

Oak Grove, OR

*The author replies . . .*

What you said regarding temperature, humidity, and precipitation sounds as if it should be true, but it's not necessarily so. There are regions on the Earth close to large bodies of water, with very high temperature and very high humidity—and negligible precipitation. One of the best known of these is the south part of Iran, along the shore of the Persian Gulf. Rainfall is less than 4 inches a year, which makes it desert terrain. Temperatures in the summer reach 130° F—and yet humidity is oppressively high. The area was often known as "Hell's Kitchen" to mariners, because of the terrible climate.

The controlling mechanism along the Persian Gulf appears to be stable high pressure zones, present for much of the year, that "cap" the local system. Parts of Southeast Asia also have the same phenomenon in the pre-monsoon months,

but that of course is usually broken by the arrival of the monsoon itself. Along the Persian Gulf, however, there is no equivalent of a monsoon, and no sharp break in the heat-humidity-no rain situation. As you might guess, people do not much enjoy living there!

CHARLES SHEFFIELD

Dear Stan,

The June 1985 "Biolog" on Robert A. Heinlein prompted me to review the reference material published in the May 1941 *Astounding*.

Editor John Campbell promotes Heinlein's "History of Tomorrow" as stimulating realism and continuity.

Apart from what appears to me to be a politically conservative interpretation, Heinlein's predictions of the near future are remarkably prescient: irrationalism in the post-WWII years and the revival of 19th century economic theories in 1980.

Still, the dynamic character of historical events suggests that future charts can be useful for stories that follow the linear pattern involved but not for those patterned on alternative probabilities.

As "Anson MacDonald," Heinlein resorts to autocratic absolutism to solve the problem of world control of nuclear weaponry. At the story's conclusion, John Campbell editorializes that the solution is obviously "unsatisfactory" as well as the Platonic implications of cultivated guardianship.

Oddly enough, this 1941 prose has a relevance and freshness more pertinent than ever today. It merits republication.

HERBERT BERGMAN

Woodland Hills, CA

*It has in fact just been republished, in microfiche, as part of a series which will eventually include all past issues in their entirety. Look for the MICRO INFORMATION CONCEPTS ads in recent issues of Analog.* ■

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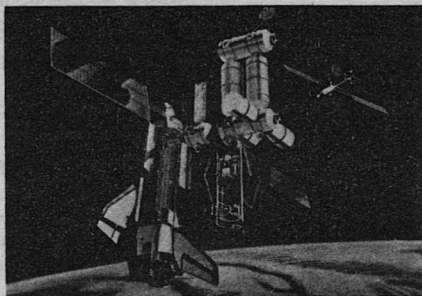
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# a calendar of analog

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## upcoming events

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### 10-12 January

ISLAND-CON (Long Island SF conference) at the Long Island Marriot, Uniondale, N.Y. Guest of Honor—David Brin. Registration—\$15 until 31 August, \$17 to 31 December. Info: Island-Con, 45 Newburgh Street, Elmont NY 11003.

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### 12-14 January

ARTICON (art-oriented SF conference) at Washington, D.C. Fan Guest of Honor—Bjo Trimble, Guest Cartoonist—Steve Stiles. Registration—\$15 until 30 November, then \$20. Info: WACO, Box 335, Arnold MD 21012.

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### 17-19 January

CHATTACON 11 (Tennessee area SF conference) at the Read House, Chattanooga, Tenn. Guest of Honor—James P. Hogan, Artist Guest of Honor—Michael Whelan, MC—Wilson "Bob" Tucker, Fan Artist Guest of Honor—Danny Gill, Special Guest—John Maddox Roberts. Registration—\$13 until 1 December, \$18 thereafter. Saturday night banquet. Info: Chattacon, Box 921, Hixson TN 37343.

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### 17-19 January

RUSTYCON III (fan-oriented convention) at Executive Inn, Seattle, Wash. Writer Guest of Honor—Vonda N. McIntyre, Artist Guest of Honor—Ilene Meyer, Fan Guest of Honor—Judy Suryan. Registration—\$16 until 31 December 1985, \$20 at the door. Info: Box 47132, Seattle WA 98146.

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### 25-26 January

CHIMERACON III (North Carolina SF conference) at Carolina Union, UNC, Chapel Hill, N.C. Guest of Honor—Orson Scott Card, Special Guests—Christopher Stasheff

and Gregory Frost. The usual plus cantina, writing workshop, trivia bowl. Registration—\$3.50/day at the door. Info: ChimeraCon III, 12-A University Gardens, Chapel Hill NC 27514 (include S.A.S.E.) (919) 967-5347.

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### 24-26 January

PERPETUAL CONFUSION (Ann Arbor area SF conference) at Plymouth Hilton, Plymouth, Mich. Guest of Honor—Somtow Sucharitkul; Artist Guest of Honor—Frank Kelly Freas; Fan Guest of Honor—Bill Roper; TM—Robert L. Asprin. Registration—\$13 until 1 January 1986, \$15 thereafter (payable to AASFA/ConFusion). Info: AASFA/ConFusion, Box 8284, Ann Arbor MI 48107.

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### 28-31 March

ALBACON III (British National SF convention) at the Central Hotel, Glasgow, Scotland. Guest of Honour—Joe Haldeman. Registration—£9 until 1 March 1986, £12 thereafter. Info: Albacon III, % Vince Docherty, 20 Hillington Gardens, Glasgow G52 1PR, Scotland, U.K. (Use airmail outside the U.K.)

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### 28 August-1 September

CONFEDERATION (44th World Science Fiction Convention) at Atlanta, Georgia. Guest of Honor—Ray Bradbury, Fan Guest of Honor—Terry Carr, TM—Bob Shaw. Registration—\$25 supporting; \$45 until 1 August 1985. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition, the works. Join now and get to nominate and vote for the Hugo awards and the John W. Campbell Award for Best New Writer. Info: ConFederation, 2500 North Atlanta Street #1986, Smyrna GA 30080. (404) 438-3943.

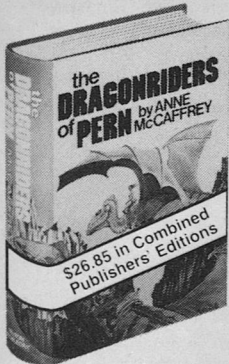
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*Items for the Calendar should be sent to the Editorial Offices six months in advance of the event.*

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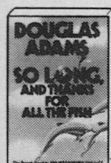
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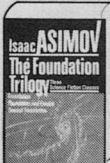
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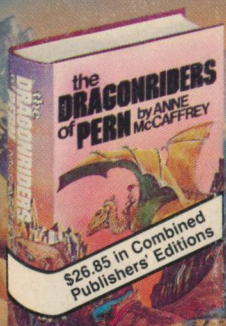
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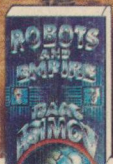
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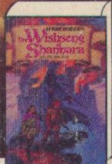
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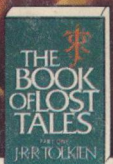
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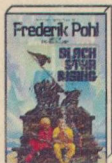
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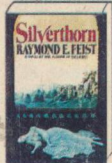
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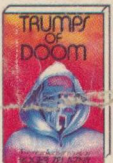
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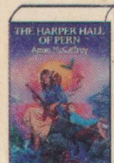
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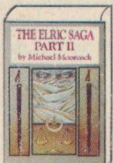
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