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BEST SCIENCE FICTION for 1972

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THE PICK OF THE YEAR'S STORIES BY

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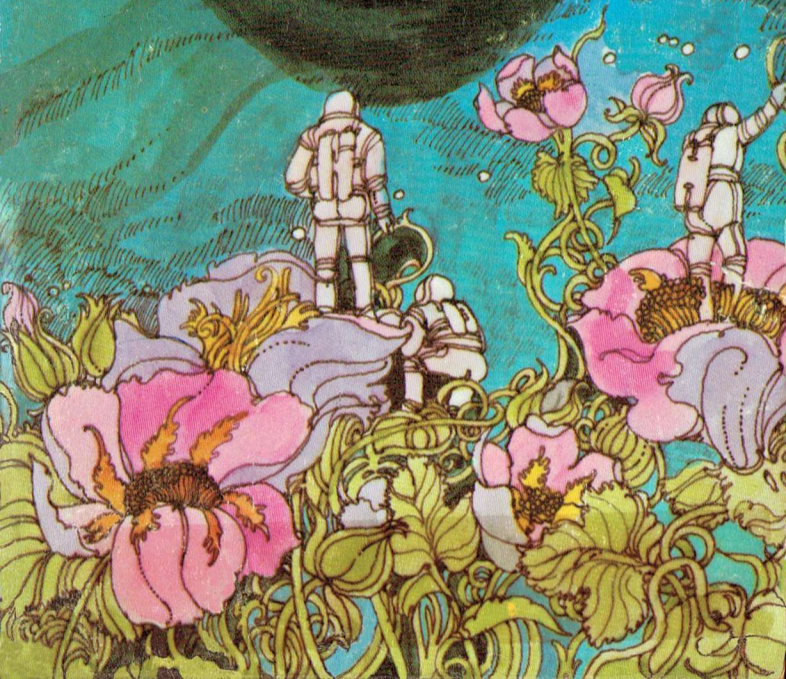
EDITED BY **FREDERIK POHL**

(THREE TIMES WINNER OF THE "BEST EDITOR" HUGO)



"Don't read us that just now," said the President harshly. "We'll hear it, but first there is something else. I want you to tell this group the full story of the Alpha-Aleph project."

"The full story, Mr. President?" Knefhausen hung on gamely. "I see. You wish me to begin with the very beginning, when first we realized at the observatory that we had located a planet—"

"No, Knefhausen. Not the cover story. The truth."

"Mr. President!" cried Knefhausen in sudden agony. "I must protest this premature disclosure of vital—"

"The truth, Knefhausen!" shouted the President. It was the first time Knefhausen had ever heard him raise his voice. "It won't go out of this room, but you must tell them everything. Tell them why it is that the Russians were right and we lied! Tell them why we sent the astronauts on a suicide mission, ordered to land on a planet that we knew all along did not exist!"

—From *The Gold at the Starbow's End* by Frederik Pohl

FREDERIK POHL

In the world of science-fictioneers, the name of Frederik Pohl is indeed of high rank. He is the author of approximately thirty novels (many in collaboration with other distinguished s-f writers), ten short story collections and the editor of no less than thirty-five anthologies. In addition he has been the editor of such magazines as *Astonishing Stories, Super Science Stories, Star Science Fiction Stories, Galaxy* and *If*, and, also, an editor of Ace Books.

A contributor to *Playboy, Family Circle, Library Journal* and some two hundred other periodicals in various languages, he has won many awards, including the "Hugo," which he won as "Best Editor" no less than three times.

He has made about four hundred appearances on English-language radio and television programs. A much sought-after lecturer, he has spoken before about five hundred scientific, social and political groups.

His writings have appeared in the ENCYCLOPEDIA BRITANNICA and other learned works—and he is affiliated with the British Interplanetary Society, the American Astronautical Society and the Science Fiction Writers of America.

PRACTICAL POLITICS 1972, of which he is the author, enjoyed a 3,000-copy distribution at the 1972 Democratic National Convention.

BEST SCIENCE FICTION FOR 1972

edited by Frederik Pohl

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INTRODUCTION

Every science-fiction anthology that includes the word "best" in its title starts out with a lie. In the first place, there isn't any such thing. What is one man's best is another man's poison.

In the second place, no anthologist *ever* has his "best." You want a story, but you have another story by the same author already and you want to be more representative. You like a story, but it's quite like a different story and you don't want to include them both. You see a story you want, but you can't afford it, because the author's agent wants too much money. You find a story that's just right, but the other five anthologies of "best" are including the same story, and what's the use of selling the same stories to the same readers under five different labels? And finally, you never are sure you've got the "best" because no one, not anyone, however assiduous and however encyclopedic his knowledge of out-of-the-way sources, can ever possibly read every science-fiction story published in the year. For one thing, no one reads that many languages, not even Darko Suvin.

So in every case, what you have is a sort of compromise or approximation, and why we anthologists go on putting words like "best" in the titles I really am not sure.

Since I am in fact using that word, I think I at least owe you the honesty of telling you what my particular compromises are. First, "best" does mean the best stories *I* have read for this period, excluding one or two that I did like a lot but have already been widely anthologized. I don't doubt for a second that there are many good

stories not included here, and maybe a few not included in any similar collection; and I regret that we have all missed them if so.

Then too, there are a couple of stories I wanted very much to include—one Italian, one German, one Russian—and the language barrier defeated me. Translating a science-fiction story is almost like translating a poem: you don't so much put it into another language as you recreate it from scratch. The available translators are seldom up to the demands, and so reluctantly I had to leave these stories out. (But I must say I regard the translation from the Japanese by Judith Merril and Tetsu Yano as a real triumph. It didn't happen easily. See the foreword to the story to see just how difficult it was.)

And finally, I allowed myself some liberties with time. Staying in the single year 1971 for source material was simply too constricting. There are not all that many good stories published in 1971, and most of them are widely available elsewhere. As far as time was concerned, I set myself the task of living up to the title's exact wording—"FOR 1972"—and what is in here is the best recent sf reading I can bring you *for* this year.

For in all truth 1971 seemed to me a rather sterile and unproductive year in the field. One of the most popular and successful writers operating in that year—I won't mention his name, but he had quite a large number of new works published—wrote me the other day, "Something bad happened to science fiction around 1956. It was blossoming and burgeoning and growing, and the growth stopped. What we have had since is often good and sometimes very good. But there isn't anything *bigger* happening in science fiction. The big developments happened a decade and a half ago."

There is enough truth in this to hurt, and certainly

most of what has been hailed as remarkable and worth emulating in sf in the last few years has been pretty uninventive: the last ripples of the New Wave are still draining into the sand, deriving what strength they possess from the simple mechanical theft of techniques from Dos Passos and Joyce and Jean Cocteau. But it is not all true. Things are happening. They are only beginning to happen, but writers are here who were not here a decade or so ago, and they are doing things worth doing. Larry Niven is one, here represented with *Inconstant Moon.* Doris Piserchia and Grahame Leman, here with the first stories they have ever had published, may be two more. Bob Shaw (read his newest novel, *Other Days, Other Eyes,* to see what I mean) is one of them, and so is Samuel R. Delany, so is Ursula K. LeGuin, so are a dozen others who are making substantive changes in everyone's understanding of what science fiction is all about.

What is happening in science fiction right now does not seem to me to be a time of innovation. Indeed, a lot of the innovation has been siphoned off into other fields: the think tanks like the RAND Corporation and books like *Future Shock* have helped themselves to some of sf's ability to describe possible futures; the coffeehouse poets and the rock singers use the coinage of stars and galaxies. What is happening instead is a kind of synthesis: the "science" that gave sf its name—and that has been conspicuously absent in most award-winning sf stories during most of the last ten years; the adventure and glamor that characterized the pulps; the solid, creative understanding of the "inner space" of personality and behavior of the "literary" sf writers.

If 1971 did not produce many masterpieces, it did at least produce a good deal of competent work. The sf writers are getting it all together, and out of it will come the new masterworks. . . .

This series of books, which has been an Ace regular for a good number of years, was originally started by Donald A. Wollheim and Terry Carr. They are no longer with the firm, or connected in any way with this anthology; but it would be bad manners, and an injustice as well, to fail to thank them for building so solid a foundation. Putting this book together was made a lot easier because they had put together so many good ones before.

Frederik Pohl

CONSTANT STAR

In the introduction to this book I spoke of new writers coming along who fuse science, adventure and humanity into a single kind of sf story. There are at least a couple dozen operating like that today, but the one I personally like best is Larry Niven. He is not a perfect writer. He gets carried away. He sometimes publishes efforts that really need a little more thought and ripening before they should properly go onto paper. But he is *good.*

Nobody ever gets to be a good writer without a lot of personal struggle and personal pain. An interesting, in fact a remarkable, thing about Larry Niven is that he never has to struggle; he was born to wealth, he could have spent his life clipping coupons and sunning by the surf. The impetus toward struggle came from within, and it is what makes him not just a good writer but an important one.

INCONSTANT MOON

Larry Niven

I

I was watching the news when the change came, like a flicker of motion at the corner of my eye. I turned

toward the balcony window. Whatever it was, I was too late to catch it.

The moon was very bright tonight.

I saw that, and smiled, and turned back. Johnny Carson was just starting his monologue.

When the first commercials came on I got up to reheat some coffee. Commercials came in strings of three and four, going on midnight. I'd have time.

The moonlight caught me coming back. If it had been bright before, it was brighter now. Hypnotic. I opened the sliding glass door and stepped out onto the balcony.

The balcony wasn't much more than a railed ledge, with standing room for a man and a woman and a portable barbecue set. These past months the view had been lovely, especially around sunset. The Power and Light Company had been putting up a glass-slab style office building. So far it was only a steel framework of open girders. Shadow-blackened against a red sunset sky, it tended to look stark and surrealistic and hellishly impressive.

Tonight . . .

I had never seen the moon so bright, not even in the desert. *Bright enough to read by,* I thought, and immediately, *but that's an illusion.* The moon was never bigger (I had read somewhere) than a quarter held nine feet away. It couldn't possibly be bright enough to read by.

It was only three-quarters full!

But, glowing high over the San Diego Freeway to the west, the moon seemed to dim even the streaming automobile headlights. I blinked against its light, and thought of men walking on the moon, leaving corrugated footprints. Once, for the sake of an article I was writing, I had been allowed to pick up a bone-dry moon rock and hold it in my hand. . . .

I heard the show starting again, and I stepped inside.

But, glancing once behind me, I caught the moon growing even brighter—as if it had come from behind a wisp of scudding cloud.

Now its light was brain-searing, lunatic.

The phone rang five times before she answered.

"Hi," I said. "Listen—"

"Hi," Leslie said sleepily, complainingly. Damn. I'd hoped she was watching television, like me.

I said, "Don't scream and shout, because I had a reason for calling. You're in bed, right? Get up and—can you get up?"

"What time is it?"

"Quarter of twelve."

"Oh, Lord."

"Go out on your balcony and look around."

"Okay."

The phone clunked. I waited. Leslie's balcony faced north and west, like mine, but it was ten stories higher, with a correspondingly better view.

Through my own window, the moon burned like a textured spotlight.

"Stan? You there?"

"Yah. What do you think of it?"

"It's gorgeous. I've never seen anything like it. What could make the moon light up like that?"

"I don't know, but isn't it gorgeous?"

"You're supposed to be the native." Leslie had only moved out here a year ago.

"Listen, I've *never* seen it like this. But there's an old legend," I said. "Once every hundred years the Los Angeles smog rolls away for a single night, leaving the air as clear as interstellar space. That way the gods can see if Los Angeles is still there. If it is, they roll the smog back so they won't have to look at it."

"I used to know all that stuff. Well, listen, I'm glad

you woke me up to see it, but I've got to get to work tomorrow."

"Poor baby."

"That's life. 'Night."

" 'Night."

Afterward I sat in the dark, trying to think of someone else to call. Call a girl at midnight, invite her to step outside and look at the moonlight . . . and she may think it's romantic or she may be furious, but she won't assume you called six others.

So I thought of some names. But the girls who belonged to them had all dropped away over the past year or so, after I started spending all my time with Leslie. One could hardly blame them. And now Joan was in Texas and Hildy was getting married, and if I called Louise I'd probably get Gordie too. The English girl? But I couldn't remember her number. Or her last name.

Besides, everyone I knew punched a time clock of one kind or another. Me, I worked for a living, but as a freelance writer I picked my hours. Anyone I woke up tonight, I'd be ruining her morning. Ah, well. . . .

The Johnny Carson Show was a swirl of grey and a roar of static when I got back to the living room. I turned the set off and went back out on the balcony.

The moon was brighter than the flow of headlights on the freeway, brighter than Westwood Village off to the right. The Santa Monica Mountains had a magical pearly glow. There were no stars near the moon. Stars could not survive that glare.

I wrote science and how-to articles for a living. I ought to be able to figure out what was making the moon do that. Could the moon be suddenly larger?

Inflating like a balloon? No. Closer, maybe. The moon, falling?

Tides! Waves fifty feet high . . . and earthquakes! San Andreas Fault splitting apart like the Grand Canyon!

Jump in my car, head for the hills . . . no, too late already. . . .

Nonsense. The moon was brighter, not bigger. I could see that. And what could possibly drop the moon on our heads like that?

I blinked, and the moon left an afterimage on my retinae. It was *that* bright.

A million people must be watching the moon right now, and wondering, like me. An article on the subject would sell big . . . if I wrote it before anyone else did.

Well, how could the moon grow brighter? Moonlight was reflected sunlight. Could the sun have gotten brighter? It must have happened after sunset, then, or it would have been noticed. . . .

I didn't like that idea.

Besides, half the Earth was in direct sunlight. A thousand correspondents for Life and Time and Newsweek and Associated Press would all be calling in from Europe, Asia, Africa . . . unless they were all hiding in cellars. Or dead. Or voiceless, because the sun was blanketing everything with static, radio and phone systems and television . . . television. Oh my God.

I was just barely beginning to be afraid.

All right, start over. The moon had become very much brighter. Moonlight, well, moonlight was reflected sunlight; any idiot knew that. Then . . . something had happened to the sun.

II

"Hello?"

"Hi. Me," I said, and then my throat froze solid. Panic! What was I going to *tell* her?

"I've been watching the moon," she said dreamily. "It's wonderful. I even tried to use my telescope, but I couldn't see a thing; it was too bright. It lights up the

whole city. The hills are all silver."

That's right, she kept a telescope on her balcony. I'd forgotten.

"I haven't tried to go back to sleep," she said. "Too much light."

I got my throat working again. "Listen, Leslie love, I started thinking about how I woke you up and how you probably couldn't get back to sleep, what with all this light. So let's go out for a midnight snack."

"Are you out of your mind?"

"No, I'm serious. I mean it. Tonight isn't a night for sleeping. We may never have a night like this again. To hell with your diet. Let's celebrate. Hot fudge sundaes, Irish coffee—"

"That's different. I'll get dressed."

"I'll be right over."

Leslie lived on the fourteenth floor of Building C of the Barrington Plaza. I rapped for admission, and waited.

And waiting, I wondered without any sense of urgency: Why Leslie?

There must be other ways to spend my last night on Earth, than with one particular girl. I could have picked a different particular girl, or even several not too particular girls, except that that didn't really apply to me, did it? Or I could have called my brother, or either set of parents—

Well, but brother Mike would have wanted a good reason for being hauled out of bed at midnight. "But, Mike, the moon is so beautiful—" Hardly. Any of my parents would have reacted similarly. Well, I had a good reason, but would they believe me?

And if they did, what then? I would have arranged a kind of wake. Let 'em sleep through it. What I wanted was someone who would join my . . . farewell party

without asking the wrong questions.

What I wanted was Leslie. I knocked again.

She opened the door just a crack for me. She was in her underwear. A stiff, misshapen girdle in one hand brushed my back as she came into my arms. "I was about to put this on."

"I came just in time, then." I took the girdle away from her and dropped it. I stooped to get my arms under her ribs, straightened up with effort, and walked us to the bedroom with her feet dangling against my ankles.

Her skin was cold. She must have been outside.

"So!" she demanded. "You think you can compete with a hot fudge sundae, do you?"

"Certainly. My pride demands it." We were both somewhat out of breath. Once in our lives I had tried to lift her cradled in my arms, in conventional movie style. I'd damn near broken my back. Leslie was a big girl, my height, and almost too heavy around the hips.

I dropped us on the bed, side by side. I reached around her from both sides to scratch her back, knowing it would leave her helpless to resist me, *ah* ha hahahaha. She made sounds of pleasure to tell me where to scratch. She pulled my shirt up around my shoulders and began scratching my back.

We pulled pieces of clothing from ourselves and each other, at random, dropping them over the edges of the bed. Leslie's skin was warm now, almost hot.

All right, now *that's* why I couldn't have picked another girl. I'd have to teach her how to scratch. And there just wasn't time.

Some nights I had a nervous tendency to hurry our lovemaking. Tonight we were performing a ritual, a rite of passage. I tried to slow it down, to make it last. I tried to make Leslie like it more. It paid off incredibly. I forgot the moon and the future when Leslie put her heels

against the backs of my knees and we moved into the ancient rhythm.

But the image that came to me at the climax was vivid and frightening. We were in a ring of blue-hot fire that closed like a noose. If I moaned in terror and ecstasy, then she must have thought it was ecstasy alone.

We lay side by side, drowsy, torpid, clinging together. I was minded to go back to sleep then, renege on my promise, sleep and let Leslie sleep . . . but instead I whispered into her ear: "Hot fudge sundae." She smiled and stirred and presently rolled off the bed.

I wouldn't let her wear the girdle. "It's past midnight. Nobody's going to pick you up, because I'd thrash the blackguard, right? So why not be comfortable?" She laughed and gave in. We hugged each other once, hard, in the elevator. It felt much better without the girdle.

III

The grey-haired counter waitress was cheerful and excited. Her eyes glowed. She spoke as if confiding a secret. "Have you noticed the moonlight?"

Ships's was fairly crowded, this time of night and this close to UCLA. Half the customers were university students. Tonight they talked in hushed voices, turning to look out through the glass walls of the twenty-four-hour restaurant. The moon was low in the west, low enough to compete with the street globes.

"We noticed," I said. "We're celebrating. Get us two hot fudge sundaes, will you?" When she turned her back I slid a ten dollar bill under the paper place mat. Not that she'd ever spend it, but at least she'd have the pleasure of finding it. I'd never spend it either.

I felt loose, casual. A lot of problems seemed suddenly to have solved themselves.

Who would have believed that peace could come to

Vietnam and Cambodia in a single night?

This thing had started around eleven-thirty, here in California. That would have put the noon sun just over the Arabian Sea, with all but a few fringes of Asia, Europe, Africa, and Australia in direct sunlight.

Already Germany was reunited, the Wall melted or smashed by shock waves. Israelis and Arabs had laid down their arms. Apartheid was dead in Africa.

And I was free. For me there were no more consequences. Tonight I could satisfy all my dark urges, rob, kill, cheat on my income tax, throw bricks at plate glass windows, burn my credit cards. I could forget the article on explosive metal forming, due Thursday. Tonight I could substitute cinnamon candy for Leslie's Pills. Tonight—

"Think I'll have a cigarette."

Leslie looked at me oddly. "I thought you'd given that up."

"You remember. I told myself if I got any overpowering urges, I'd have a cigarette. I did that because I couldn't stand the thought of never smoking again."

"But it's been months!" she laughed.

"But they keep putting cigarette ads in my magazines!"

"It's a plot. All right, go have a cigarette."

I put coins in the machine, hesitated over the choice, finally picked a mild filter. It wasn't that I wanted a cigarette. But certain events call for champagne, and others for cigarettes. There is the traditional last cigarette before a firing squad. . . .

I lit up. *Here's to lung cancer.*

It tasted just as good as I remembered; though there was a faint stale undertaste, like a mouthful of old cigarette butts. The third lungful hit me oddly. My eyes unfocused and everything went very calm. My heart pulsed loudly in my throat.

"How does it taste?"

"Strange. I'm buzzed," I said.

Buzzed! I hadn't even heard the word in fifteen years. In high school we'd smoked to get that buzz, that quasi-drunkenness produced by capillaries constricting in the brain. The buzz had stopped coming after the first few times, but we'd kept smoking, most of us.

I put it out. The waitress was picking up our sundaes.

Hot and cold, sweet and bitter: there is no taste quite like that of a hot fudge sundae. To die without tasting it again would have been a crying shame. But with Leslie it was a *thing*, a symbol of all rich living. Watching her eat was more fun than eating myself.

Besides—I'd killed the cigarette to taste the ice cream. Now, instead of savoring the ice cream, I was anticipating Irish coffee.

Too little time.

Leslie's dish was empty. She stage-whispered, "Aahh!" and patted herself over the navel.

A customer at one of the small tables began to go mad.

I'd noticed him coming in. A lean scholarly type wearing sideburns and steel-rimmed glasses, he had been continually twisting around to look out at the moon. Like others at other tables, he seemed high on a rare and lovely natural phenomenon.

Then he got it. I saw his face changing, showing suspicion, then disbelief, then horror, horror and helplessness.

"Let's go," I told Leslie. I dropped quarters on the counter and stood up.

"Don't you want to finish yours?"

"Nope. We've got things to do. How about some Irish coffee?"

"And a Pink Lady for me? Oh, look!" She turned full around.

The scholar was climbing up on a table. He balanced, spread wide his arms and bellowed, "Look out your windows!"

"You get down from there!" a waitress demanded, jerking emphatically at his pants leg.

"The world is coming to an end! Far away on the other side of the sea, death and hellfire—"

But we were out the door, laughing as we ran. Leslie panted, "We may have—escaped a religious—riot in there!"

I thought of the ten I'd left under my plate. Now it would please nobody. Inside, a prophet was shouting his message of doom to all who would hear. The grey-haired woman with the glowing eyes would find the money and think: They knew it too.

Buildings blocked the moon from the Red Barn's parking lot. The street lights and the indirect moonglare were pretty much the same color. The night only seemed a bit brighter than usual.

I didn't understand why Leslie stopped suddenly in the driveway. But I followed her gaze, straight up to where a star burned very brightly just south of the zenith.

"Pretty," I said.

She gave me a very odd look.

There were no windows in the Red Barn. Dim artificial lighting, far dimmer than the queer cold light outside, showed on dark wood and quietly cheerful customers. Nobody seemed aware that tonight was different from other nights.

The sparse Tuesday night crowd was gathered mostly around the piano bar. A customer had the mike. He was singing some half-familiar song in a wavering weak voice, while the black pianist grinned and played a schmaltzy background.

I ordered two Irish coffees and a Pink Lady. At Leslie's questioning look I only smiled mysteriously.

How ordinary the Red Barn felt. How relaxed; how happy. We held hands across the table, and I smiled and was afraid to speak. If I broke the spell, if I said the wrong thing . . .

The drinks arrived. I raised an Irish coffee glass by the stem. Sugar, Irish whiskey, and strong black coffee, with thick whipped cream floating on top. It coursed through me like a magical potion of strength, dark and hot and powerful.

The waitress waved back my money. "See that man in the turtleneck, there at the end of the piano bar? He's buying," she said with relish. "He came in two hours ago and handed the bartender a hundred dollar bill."

So that was where all the happiness was coming from. Free drinks! I looked over, wondering what the guy was celebrating.

A thick-necked, wide-shouldered man in a turtleneck and sports coat, he sat hunched over into himself, with a wide bar glass clutched tight in one hand. The pianist offered him the mike, and he waved it by, the gesture giving me a good look at his face. A square, strong face, now drunk and miserable and scared. He was ready to cry from fear.

So I knew what he was celebrating.

Leslie made a face. "They didn't make the Pink Lady right."

There's one bar in the world that makes a Pink Lady the way Leslie likes it, and it isn't in Los Angeles. I passed her the other Irish coffee, grinning an I-told-you-so grin. Forcing it. The other man's fear was contagious. She smiled back, lifted her glass and said, "To the blue moonlight."

I lifted my glass to her, and drank. But it wasn't the toast I would have chosen.

The man in the turtleneck slid down from his stool. He moved carefully toward the door, his course slow and straight as an ocean liner cruising into dock. He pulled the door wide, and turned around, holding it open, so that the weird blue-white light streamed past his broad black silhouette.

Bastard. He was waiting for someone to figure it out, to shout out the truth to the rest. *Fire and doom—*

"Shut the door!" someone bellowed.

"Time to go," I said softly.

"What's the hurry?"

The hurry? He might *speak!* But I couldn't say that. . . .

Leslie put her hand over mine. "I know. I *know.* But we can't run away from it, can we?"

A fist closed hard on my heart. She'd known, and I hadn't noticed?

The door closed, leaving the Red Barn in reddish dusk. The man who had been buying drinks was gone.

"Oh, God. When did you figure it out?"

"Before you came over," she said. "But when I tried to check it out, it didn't work."

"Check it out?"

"I went out on the balcony and turned the telescope on Jupiter. Mars is below the horizon these nights. If the sun's gone nova, all the planets ought to be lit up like the moon, right?"

"Right. Damn." I should have thought of that myself. But Leslie was the stargazer. I knew some astrophysics, but I couldn't have found Jupiter to save my life.

"But Jupiter wasn't any brighter than usual. So then I didn't know *what* to think."

"But then—" I felt hope dawning fiery hot. Then I remembered. "That star, just overhead. The one you stared at."

"Jupiter."

"All lit up like a fucking neon sign. Well, that tears it."

"Keep your voice down."

I *had* been keeping my voice down. But for a wild moment I wanted to stand up on a table and scream! *Fire and doom*—what right had they to be ignorant?

Leslie's hand closed tight on mine. The urge passed. It left me shuddering. "Let's get out of here. Let 'em think there's going to be a dawn."

"There is." Leslie laughed a bitter, barking laugh like nothing I'd ever heard from her. She walked out while I was reaching for my wallet—and remembering that there was no need.

Poor Leslie. Finding Jupiter its normal self must have looked like a reprieve—until the white spark flared to shining glory an hour and a half late. An hour and a half, for sunlight to reach Earth by way of Jupiter.

When I reached the door Leslie was half-running down Westwood toward Santa Monica. I cursed and ran to catch up, wondering if she'd suddenly gone crazy.

Then I noticed the shadows ahead of us. All along the other side of Santa Monica Boulevard: moon shadows, in horizontal patterns of dark and blue-white bands.

I caught her at the corner.

The moon was setting.

A setting moon always looks tremendous. Tonight it glared at us through the gap of sky beneath the freeway, terribly bright, casting an incredible complexity of lines and shadows. Even the unlighted crescent glowed pearly bright with Earthshine.

Which told me all I wanted to know about what was happening on the lighted side of Earth.

And on the moon? The men of Apollo Nineteen must have died in the first few minutes of nova sunlight. Trapped out on a lunar plain, hiding perhaps behind a melting boulder . . . Or were they on the night side? I couldn't remember. Hell, they could outlive us all.

I felt a stab of envy and hatred.

And pride. We'd put them there. We reached the moon before the nova came. A little longer, we'd have reached the stars.

The disc changed oddly as it set. A dome, a flying saucer, a lens, a line . . .

Gone.

Gone. Well, that was that. Now we could forget it; now we could walk around outside without being constantly reminded that something was *wrong*. Moonset had taken all the queer shadows out of the city.

But the clouds had an odd glow to them. As clouds glow after sunset, tonight the clouds shone livid white at their western edges. And they streamed too quickly across the sky. As if they tried to run . . .

When I turned to Leslie, there were big tears rolling down her cheeks.

"Oh, damn." I took her arm. "Now stop it. Stop it."

"I can't. You know I can't stop crying once I get started."

"This wasn't what I had in mind. I thought we'd do things we've been putting off, things we like. It's our last chance. Is this the way you want to die, crying on a street corner?"

"I don't want to die at all!"

"Tough shit!"

"Thanks a lot." Her face was all red and twisted. Leslie was crying as a baby cries, without regard for dignity or appearance. I felt awful. I felt guilty, and I *knew* the nova wasn't my fault, and it made me angry.

"I don't want to die either!" I snarled at her. "You show me a way out and I'll take it. Where would we go? The South Pole? It'd just take longer. The moon must be molten all across its day side. Mars? When this is over Mars will be part of the sun, like the Earth. Alpha Centauri? The acceleration we'd need, we'd be spread

across a wall like peanut butter and jelly—"

"Oh, shut up."

"Right."

"Hawaii. Stan, we could get to the airport in twenty minutes. We'd get two hours extra, going west! Two hours more before sunrise!"

She had something there. Two hours was worth any price! But I'd worked this out before, staring at the moon from my balcony. "No. We'd die sooner. Listen, love, we saw the moon go bright about midnight. That means California was at the back of the Earth when the sun went nova."

"Yes, that's right."

"Then we must be furthest from the shock wave."

She blinked. "I don't understand."

"Look at it this way. First the sun explodes. That heats the air and the oceans, all in a flash, all across the day side. The steam and superheated air expand *fast*. A flaming shock wave comes roaring over into the night side. It's closing on us right now. Like a noose. But it'll reach Hawaii first. Hawaii is two hours closer to the sunset line."

"Then we won't see the dawn. We won't live even that long."

"No."

"You explain things so well," she said bitterly. "A flaming shock wave. So graphic."

"Sorry. I've been thinking about it too much. Wondering what it will be like."

"Well, stop it." She came to me and put her face in my shoulder. She cried quietly. I held her with one arm and used the other to rub her neck, and I watched the streaming clouds, and I didn't think about what it would be like.

Didn't think about the ring of fire closing on us.

It was the wrong picture anyway.

I thought of how the oceans had boiled on the day side, so that the shock wave had been mostly steam to start with. I thought of the millions of square miles of ocean it had to cross. It would be cooler and wetter when it reached us. And the Earth's rotation would spin it like the whirlpool in a bathtub.

Two counterrotating hurricanes of live steam, one north, one south. That was how it would come. We were lucky. California would be near the eye of the northern one.

A hurricane wind of live steam. It would pick a man up and cook him in the air, strip the steamed flesh from him and cast him aside. It was going to hurt like hell.

We would never see the sunrise. In a way that was a pity. It would be spectacular.

Thick parallel streamers of clouds were drifting across the stars, too fast. Jupiter dimmed, then went out. Could it be starting already? Heat lightning jumped—

"Aurora," I said.

"What?"

"There's a shock wave from the sun, too. There should be an aurora like nothing anybody's ever seen before."

Leslie laughed suddenly, jarringly. "It seems so strange, standing on a street corner talking like this! Stan, are we dreaming it?"

"We could pretend—"

"No. Most of the human race must be dead already."

"Yah."

"And there's nowhere to go."

"Damn it, you figured that out long ago, all by yourself. Why bring it up now?"

"You could have let me sleep," she said bitterly. "I was dropping off to sleep when you whispered in my ear."

I didn't answer. It was true.

"'Hot fudge sundae'," she quoted. Then, "It wasn't a bad idea, actually. Breaking my diet."

I started to giggle.

"Stop that."

"We could go back to your place now. Or my place. To sleep."

"I suppose. But we couldn't sleep, could we? No, don't say it. We take sleeping pills, and five hours from now we wake up screaming. I'd rather stay awake. At least we'll know what's happening."

But if we took all the pills . . . but I didn't say it. I said, "Then how about a picnic?"

"Where?"

"The beach, maybe. Who cares? We can decide later."

IV

All the markets were closed. But the liquor store next to the Red Barn was one I'd been using for years. They sold us foie gras, crackers, a couple of bottles of chilled champagne, six kinds of cheese and a hell of a lot of nuts—I took one of everything—more crackers, a bag of ice, frozen rumaki hors d'oeuvres, a fifth of an ancient brandy that cost twenty-five bucks, a matching fifth of Cherry Heering for Leslie, six-packs of beer and Bitter Orange. . . .

By the time we had piled all that into a dinky store cart, it was raining. Big fat drops spattered in flurries across the acre of plate glass that fronted the store. Wind howled around the corners.

The salesman was in a fey mood, bursting with energy. He'd been watching the moon all night. "And now this!" he exclaimed as he packed our loot into bags. He was a small, muscular old man with thick arms and shoulders. "It *never* rains like this in California. It comes

down straight and heavy, when it comes at all. Takes days to build up."

"I know." I wrote him a check, feeling guilty about it. He'd known me long enough to trust me. But the check was good. There were funds to cover it. Before opening hours the check would be ash, and all the banks in the world would be bubbling in the heat of the sun. But that was hardly my fault.

He piled our bags in the cart, set himself at the door. "Now when the rain lets up, we'll run these out. Ready?" I got ready to open the door. The rain came like someone had thrown a bucket of water at the window. In a moment it had stopped, though water still streamed down the glass. "Now!" cried the salesman, and I threw the door open and we were off. We reached the car laughing like maniacs. The wind howled around us, sweeping up spray and hurling it at us.

"We picked a good break. You know what this weather reminds me of? Kansas," said the salesman. "During a tornado."

Then suddenly the sky was full of gravel! We yelped and ducked, and the car rang to a million tiny concussions, and I got the car door unlocked and pulled Leslie and the salesman in after me. We rubbed our bruised heads and looked out at white gravel bouncing everywhere.

The salesman picked a small white pebble out of his collar. He put it in Leslie's hand, and she gave a startled squeak and handed it to me, and it was cold.

"Hail," said the salesman. "Now I really don't get it."

Neither did I. I could only think that it had something to do with the nova. But what? How?

"I've got to get back," said the salesman. The hail had expended itself in one brief flurry. He braced himself, then went out of the car like a Marine taking a hill. We never saw him again.

The clouds were churning up there, forming and disappearing, sliding past each other faster than I'd ever seen clouds move—their bellies glowing by city light.

"It must be the nova," Leslie said shivering.

"But how? If the shock wave were here already, we'd be dead—or at least deaf. Hail?"

"Who cares? Stan, we don't have *time!*"

I shook myself. "All right. What would you like to do most, right now?"

"Watch a baseball game."

"It's two in the morning," I pointed out.

"That lets out a lot of things, doesn't it?"

"Right. We've hopped our last bar. We've seen our last play, and our last clean movie. What's left?"

"Looking in jewelry store windows."

"Seriously? Your last night on Earth?"

She considered, then answered. "Yes."

By damn, she meant it. I couldn't think of anything duller. "Westwood or Beverly Hills?"

"Both."

"Now, *look*—"

"Beverly Hills, then."

We drove through another spatter of rain and hail—a capsule tempest. We parked half a block from the Tiffany salesroom.

The sidewalk was one continuous puddle. Secondhand rain dripped on us from various levels of the buildings overhead. Leslie said, "This is great. There must be half a dozen jewelry stores in walking distance."

"I was thinking of driving."

"No no no, you don't have the proper attitude. One must window shop on foot. It's in the rules."

"But the rain!"

"You won't die of pneumonia. You won't have time," she said, too grimly.

Tiffany's had a small branch office in Beverly Hills, but they didn't put expensive things in the windows at night. There were a few fascinating toys, that was all.

We turned up Rodeo Drive—and struck it rich. Tibor showed an infinite selection of rings, ornate and modern, large and small, in all kinds of precious and semiprecious stones. Across the street, Van Cleef and Arpel showed brooches, men's wristwatches of elegant design, bracelets with tiny watches in them, and one window that was all diamonds.

"Oh, lovely," Leslie breathed, caught by the flashing diamonds. "What they must look like in daylight! . . . wups—"

"No, that's a good thought. Imagine them at dawn, flaming with nova light, while the windows shatter to let the raw daylight in. Want one? The necklace?"

"Oh, *may* I? Hey, hey, I was kidding! Put that down, you idiot, there must be alarms in the glass."

"Look, nobody's going to be wearing any of that stuff between now and morning. Why shouldn't we get some good out of it?"

"We'd be caught!"

"Well, you *said* you wanted to window shop."

"I don't want to spend my last hour in a cell. If you'd brought the car we'd have *some* chance—"

"—Of getting away. Right. I *wanted* to bring the car—" But at that point we both cracked up entirely, and had to stagger away holding onto each other for balance.

There were a good half-dozen jewelry stores on Rodeo. But there was more. Toys, books, shirts and ties in odd and advanced styling. In Francis Orr, a huge plastic cube full of new pennies. A couple of damn strange clocks further on. There was an extra kick in window shopping; knowing that we could break a window and take anything we wanted badly enough.

We walked hand in hand, swinging our arms. The sidewalks were ours alone; all others had fled the mad weather. The clouds still churned overhead.

"I wish I'd known it was coming," Leslie said suddenly. "I spent the whole day fixing a mistake in a program. Now we'll never run it."

"What would you have done with the time? A baseball game?"

"Maybe. No. The standings don't matter now." She frowned at dresses in a store window. "What would you have done?"

"Gone to the Blue Sphere for cocktails," I said promptly. "It's a topless place. I used to go there all the time. I hear they've gone full nude now."

"I've never been to one of those. How late are they open?"

"Forget it. It's almost two-thirty."

Leslie mused, looking at giant stuffed animals in a toy store window. "Isn't there someone you would have murdered, if you'd had the time?"

"Now, you *know* my agent lives in New York."

"Why him?"

"My child, why would any writer want to murder his agent? For the manuscripts he loses under other manuscripts. For his ill-gotten ten percent, and the remaining ninety percent that he sends me grudgingly and late. For—"

Suddenly the wind roared and rose up against us. Leslie pointed, and we ran for a deep doorway that turned out to be Gucchi's. We huddled against the glass.

The wind was suddenly choked with hail the size of marbles. Glass broke somewhere, and alarms lifted thin, frail voices into the wind. There was more than hail in the wind! There were rocks!

I caught the smell and taste of seawater.

We clung together in the expensively wasted space in

front of Gucchi's. I coined a short-lived phrase and screamed, "Nova weather! How the blazes did it—" But I couldn't hear myself, and Leslie didn't even know I was shouting.

Nova weather, How did it get here so fast? Coming over the pole, the nova shock wave would have to travel about four thousand miles—at least a five hour trip.

No. The shock wave would travel in the stratosphere, where the speed of sound was higher, then propagate down. Three hours was plenty of time. Still, I thought, it should not have come as a rising wind. On the other side of the world, the exploding sun was tearing our atmosphere away and hurling it at the stars. The shock should have come as a single vast thunderclap.

For an instant the wind gentled, and I ran down the sidewalk pulling Leslie after me. We found another doorway as the wind picked up again. I thought I heard a siren coming to answer the alarm.

At the next break we splashed across Wilshire and reached the car. We sat there panting, waiting for the heater to warm up. My shoes felt squishy. The wet clothes stuck to my skin.

Leslie shouted, "How much longer?"

"I don't know! We ought to have *some* time."

"We'll have to spend our picnic indoors!"

"Your place or mine? Yours," I decided, and pulled away from the curb.

V

Wilshire Boulevard was flooded to the hubcaps in spots. The spurt of hail and sleet had become a steady, pounding rain. Fog lay flat and waist-deep ahead of us, broke swirling over our hood, churned in a wake behind us. Weird weather.

Nova weather. The shock wave of scalding super-

heated steam hadn't happened. Instead, a mere hot wind roaring through the stratosphere, the turbulence eddying down to form strange storms at ground level.

We parked illegally on the upper parking level. My one glimpse of the lower level showed it to be flooded. I opened the trunk and lifted two heavy paper bags.

"We must have been crazy," Leslie said, shaking her head. "We'll never use all this."

"Let's take it up anyway."

She laughed at me. "But why?"

"Just a whim. Will you help me carry it?"

We took double armfuls up to the fourteenth floor. That still left a couple of bags in the trunk. "Never mind them," Leslie said. "We've got the rumaki and the bottles and the nuts. What more do we need?"

"The cheeses. The crackers. The foie gras."

"Forget 'em."

"No."

"You're out of your mind," she explained to me, slowly so that I would understand. "You could be steamed dead on the way down! We might not have more than a few minutes left, and you want food for a week! *Why?*"

"I'd rather not say."

"Go then!" She slammed the door with terrible force.

The elevator was an ordeal. I kept wondering if Leslie was right. The shrilling of the wind was muffled, here at the core of the building. Perhaps it was about to rip electrical cables somewhere, leave me stranded in a darkened box. But I made it down.

The upper level was knee-deep in water.

My second surprise was that it was lukewarm, like old bathwater, unpleasant to wade through. Steam curdled on the surface, then blew away on a wind that howled through the concrete echo chamber like the screaming of the damned.

Going up was another ordeal. If what I was thinking was wish fulfillment, if a roaring wind of live steam caught me now . . . I'd feel like such an idiot. . . . But the doors opened, and the lights hadn't even flickered.

Leslie wouldn't let me in.

"Go away!" She shouted through the locked door. "Go eat your cheese and crackers somewhere else!"

"You got another date?"

That was a mistake. I got no answer at all.

I could almost see her viewpoint. The extra trip for the extra bags was no big thing to fight about; but why did it have to be? How long was our love affair going to last, anyway? An hour, with luck. Why back down on a perfectly good argument, to preserve so ephemeral a thing?

"I wasn't going to bring this up," I shouted, hoping she could hear me through the door. The wind must be three times as loud on the other side. "We may need food for a week! And a place to hide!"

Silence. I began to wonder if I could kick the door down. Would I be better off waiting in the hall? Eventually she'd have to—

The door opened. Leslie was pale. "That was cruel," she said quietly.

"I can't promise anything. I wanted to wait, but you forced it. I've been wondering if the sun really has exploded."

"That's cruel. I was just getting used to the idea." She turned her face to the door jamb. Tired, she was tired. I'd kept her up too late. . . .

"Listen to me. It was all wrong," I said. "There should have been an aurora borealis to light up the night sky from pole to pole. A shock wave of particles exploding out of the sun, traveling at an inch short of the speed of light, would rip into the atmosphere like—why, we'd have seen blue fire over every building!

"Then, the storm came too slow," I screamed, to be heard above the thunder. "A nova would rip away the sky over half the planet. The shock wave would move around the night side with a sound to break all the glass in the world, all at once! And crack concrete and marble—and, Leslie love, it just hasn't happened. So I started wondering."

She said it in a mumble. "Then what is it?"

"A flare. The worst—"

She shouted it at me like an accusation. "A flare! A solar flare! You think the sun could light up like that—"

"Easy, now—"

"—could turn the moon and planets into so many torches, then fade out as if nothing had happened! Oh, you idiot—"

"May I come in?"

She looked surprised. She stepped aside, and I bent and picked up the bags and walked in.

The glass doors rattled as if giants were trying to beat their way in. Rain had squeezed through cracks to make dark puddles on the rug.

I set the bags on the kitchen counter. I found bread in the refrigerator, dropped two slices in the toaster. While they were toasting I opened the foie gras.

"My telescope's gone," she said. Sure enough, it was. The tripod was all by itself on the balcony, on its side.

I untwisted the wire on a champagne bottle. The toast popped up, and Leslie found a knife and spread both slices with foie gras. I held the bottle near her ear, figuring to trip conditioned reflexes.

She did smile fleetingly as the cork popped. She said, "We should set up our picnic grounds here. Behind the counter. Sooner or later the wind is going to break those doors and shower glass all over everything."

That was a good thought. I slid around the partition, swept all the pillows off the floor and the couch and

came back with them. We set up a nest for ourselves.

It was kind of cosy. The kitchen counter was three and a half feet high, just over our heads, and the kitchen alcove itself was just wide enough to swing out elbows comfortably. Now the floor was all pillows. Leslie poured the champagne into brandy snifters, all the way to the lip.

I searched for a toast, but there were just too many possibilities, all depressing. We drank without toasting. And then carefully set the snifters down and slid forward into each other's arms. We could sit that way, face to face, leaning sideways against each other.

"We're going to die," she said.

"Maybe not."

"Get used to the idea, I have," she said. "Look at you, you're all nervous now. Afraid of dying. Hasn't it been a lovely night?"

"Unique. I wish I'd known in time to take you to dinner."

Thunder came in a string of six explosions. Like bombs in an air raid. "Me too," she said when we could hear again.

"I wish I'd known this afternoon."

"Pecan pralines!"

"Farmer's Market. Double-roasted peanuts. Who would *you* have murdered, if you'd had the time?"

"There was a girl in my sorority—"

—and she was guilty of sibling rivalry, so Leslie claimed. I named an editor who kept changing his mind. Leslie named one of my old girlfriends, I named her only old boyfriend that I knew about, and it got to be kind of fun before we ran out. My brother Mike had forgotten my birthday once. The fiend.

The lights flickered, then came on again.

Too casually, Leslie asked, "Do you really think the sun might go back to normal?"

"It better *be* back to normal. Otherwise we're dead anyway. I wish we could see Jupiter."

"Dammit, answer me! Do you think it was a flare?"

"Yes."

"Why?"

"Yellow dwarf stars don't go nova."

"What if ours did?"

"The astronomers know a lot about novas," I said. "More than you'd guess. They can see them coming months ahead. Sol is a gee-naught yellow dwarf. They don't go nova at all. They have to wander off the main sequence first, and that takes millions of years."

She pounded a fist softly on my back. We were cheek to cheek; I couldn't see her face. "I don't want to believe it. I don't dare. Stan, nothing like this has ever happened before. How can you know?"

"Something did."

"What? I don't believe it. We'd remember."

"Do you remember the first moon landing? Aldrin and Armstrong?"

"Of course. We watched it at Earl's Lunar Landing Party."

"They landed on the biggest, flattest place they could find on the moon. They sent back several hours of jumpy home movies, took a lot of very clear pictures, left corrugated footprints all over the place. And they came home with a bunch of rocks.

"Remember? People said it was a long way to go for rocks. But the first thing anyone noticed about those rocks was that they were half-melted.

"Sometime in the past, oh, say the past hundred thousand years—there's no way of marking it closer than that—the sun flared up. It didn't stay hot enough long enough to leave any marks on the Earth. But the moon doesn't have an atmosphere to protect it. All the rocks melted on one side."

The air was warm and damp. I took off my coat, which was heavy with rainwater. I fished the cigarettes and matches out, lit a cigarette and exhaled past Leslie's ear.

"We'd remember. It *couldn't* have been this bad."

"I'm not so sure. Suppose it happened over the Pacific? It wouldn't do *that* much damage. Or over the American continents. It would have sterilized some plants and animals and burned down a lot of forests, and who'd know? The sun went back to normal, that time. It might again. The sun is a four percent variable star. Maybe it gets a touch more variable than that, every so often."

Something shattered in the bedroom. A window? A wet wind touched us, and the shriek of the storm was louder.

"Then we could live through this," Leslie said hesitantly.

"I believe you've put your finger on the crux of the matter. Skol!" I found my champagne and drank deep. It was past three in the morning, with a hurricane beating at our doors.

"Then shouldn't we be doing something about it?"

"We are."

"Something like trying to get up into the hills! Stan, there're going to be floods!"

"You bet your ass there are, but they won't rise this high. Fourteen stories. Listen, I've thought this through. We're in a building that was designed to be earthquake proof. You told me so yourself. It'd take more than a hurricane to knock it over.

"As for heading for the hills, what hills? We won't get far tonight, not with the streets flooded already. Suppose we could get up into the Santa Monica Mountains; then what? Mudslides, that's what. That area won't stand up to what's coming. The flare must have boiled away enough water to make another ocean. It's going to rain for forty days and forty nights! Love, this is

the safest place we could have reached tonight."

"Suppose the polar caps melt?"

"Yeah . . . well, we're pretty high, even for that. Hey, maybe that last flare was what started Noah's Flood. Maybe it's happening again. Sure as hell, there's not a place on Earth that isn't the middle of a hurricane. Those two great counterrotating hurricanes, by now they must have broken up into hundreds of little storms—"

The glass doors exploded inward. We ducked, and the wind howled about us and dropped rain and glass on us.

"At least we've got food!" I shouted. "If the floods maroon us here, we can last it out!"

"But if the power goes, we can't cook it! And the refrigerator—"

"We'll cook everything we can. Hardboil all the eggs—"

The wind rose about us. I stopped trying to talk.

Warm rain sprayed us horizontally and left us soaked. Try to cook in a hurricane? I'd been stupid; I'd waited too long. The wind would tip boiling water on us if we tried it. Or hot grease—

Leslie screamed, "We'll have to use the oven!"

Of course. The oven couldn't possibly fall on us.

We set it for 400° and put the eggs in, in a pot of water. We took all the meat out of the meat drawer and shoved it in on a broiling pan. Two artichokes in another pot. The other vegetables we could eat raw.

What else? I tried to think.

Water. If the electricity went, probably the water and telephone lines would too. I turned on the faucet over the sink and started filling things: pots with lids, Leslie's thirty-cup percolator that she used for parties, her wash bucket. She clearly thought I was crazy, but I didn't trust the rain as a water source; I couldn't control it.

The sound. Already we'd stopped trying to shout

through it. Forty days and nights of this and we'd be stone deaf. Cotton? Too late to reach the bathroom. Paper towels! I tore and wadded and made four plugs for our ears.

Sanitary facilities? Another reason for picking Leslie's place over mine. When the plumbing stopped, there was always the balcony.

And if the flood rose higher than the fourteenth floor, there was the roof. Twenty stories up. If it went higher than that, there would be damn few people left when it was over.

And if it was a nova?

I held Leslie a bit more closely, and lit another cigarette one-handed. All the wasted planning, if it was a nova. But I'd have been doing it anyway. You don't stop planning just because there's no hope.

And when the hurricane turned to live steam, there was always the balcony. At a dead run, and over the railing, in preference to being boiled alive.

But now was not the time to mention it.

Anyway, she'd probably thought of it herself.

The lights went out about four. I turned off the oven, in case the power should come back. Give it an hour to cool down, then I'd put all the food in Baggies.

Leslie was asleep, sitting up in my arms. How could she sleep, not knowing? I piled pillows behind her and let her back easy.

For some time I lay on my back, smoking, watching the lightning make shadows on the ceiling. We had eaten all the foie gras and drunk one bottle of champagne. I thought of opening the brandy, but decided against it, with regret.

A long time passed. I'm not sure what I thought about. I didn't sleep, but certainly my mind was in idle. It only gradually came to me that the ceiling, between

lightning flashes, had turned grey.

I rolled over, gingerly, soggily. Everything was wet. My watch said it was nine-thirty.

I crawled around the partition into the living room. I'd been ignoring the storm sounds so long that it took a faceful of warm whipping rain to remind me. There was a hurricane going on. But charcoal-grey light was filtering through the black clouds.

So. I was right to have saved the brandy. Floods, storms, intense radiation, fires lit by the flare—if the toll of destruction was as high as I expected, then money was about to become worthless. We would need trade goods.

I was hungry. I ate two eggs and some bacon—still warm—and started putting the rest of the food away. We had food for a week, maybe . . . but hardly a balanced diet. Maybe we could trade with other apartments. This was a big building. There must be empty apartments, too, that we could raid for canned soup and the like. And refugees from the lower floors to be taken care of, if the waters rose high enough . . .

Damn! I missed the nova. Life had been simplicity itself last night. Now . . . did we have medicines? Were there doctors in the building? There would be dysentery and other plagues. And hunger. There was a supermarket near here; could we find a scuba rig in the building?

But I'd get some sleep first. Later we could start exploring the building. The day had become a lighter charcoal grey. Things could be worse, far worse. I thought of the radiation that must have sleeted over the far side of the world, and wondered if our children would colonize Europe, or Asia, or Africa.

FROM JAPAN

Ryu Mistsuse is a highly talented Japanese writer of science fiction. This is his first story to appear in the English language, and one of the first Japanese sf stories by anyone ever to be successfully translated.

The fault lies not in Japanese writers, but in the considerable difficulties of rendering into one language thoughts that were first thought and set on paper in a language so different that even the simple words used in counting from one to five cannot be simply translated by substituting words.

In order to bring you this story, Tetsu Yano and Judith Merril worked in collaboration, first in Canada, later in Tokyo, for more than a month. Miss Merril had to learn a good deal of the Japanese language; Yano, whose English was already good, had to acquire a whole new vocabulary of special terms. Since both are themselves sf writers of considerable success, they had everything going for them; even so, the actual decision to do the work was made at the time of that marvelous Japanese sf conference of 1970 (which I was also invited to, and which remains among the most exciting and rewarding times I have ever spent outside of the United States), and it was not until April of 1972 that the first story in what will ultimately be an English-language anthology of the best current Japanese sf was available. This is it.

THE SUNSET, 2217 A.D.

by Ryu Mitsuse

translated by Tetsu Yano & Judith Merril

(This story is part of a future-history pattern developed by Ryu Mitsuse, and familiar to Japanese science-fiction readers. An occasional 'backgrounder' footnote has been added here, where the story seems to take too much knowledge for granted. The name, Shira-i, is pronounced halfway between Sheera-i (as in *my*) and Sheer-ah-ee.)

They say visitors to East Canal City always used to buy at least one souvenir to take home—a certain photograph—

—the clustered buildings of the port-city rise from the vast Mars desert like an armada poised for space—in the foreground, the dust-stack of the atomic powerplant, the observation tower on top of City Hall and the rocket-launching gantry dominate a jumbled city skyline—above the far horizon hangs a huge full-Earth, its emerald surface blued inside the envelope of atmosphere, its seas and continents floating like shadows in a thick aura of refracted light—

It was ridiculous, of course: fakery obvious to anyone at a glance. Earth seen from Mars never looms so large; its surface markings never show so clear. Earth, seen from Mars on a clear night after the sand-wind has subsided appears just as a brilliant star, barely tinted with faint beautiful blue-green. A photograph of Earth shot from the Moon had been combined with a city-scape of East Canal.

Every tourist center manufactures pictures like this to sell to travelers, more or less retouched to add some novelty or beauty beyond actual fact. *The Earth from*

East Canal City was just one example of a type of barefaced fraud familiar everywhere—and of course always censured officially; except in this case the city authorities themselves were, in a sense, behind it. In any case, it sold very well.

Earth-from-Moon or Earth-from-Mars—the tourists didn't care. For them, this particular picture was a concrete image of all their most profound impressions of space travel: a memento to help them make clear to friends on Earth what they had seen and felt where they had been: the passion of space compressed upon a sheet of paper twenty centimeters long and twelve wide—Cr. 5 per sheet.

The covered-arcade "streets" of East Canal City connect by means of tunneled traffic corridors with the lower-level installations at East Canal Spaceport. Shira-i's "shop"—a few plastic panels thrown together to form a stall—stood in one corner of the B-Gate corridor. Dozens of different scenes of Earth and Mars and the spacefleet were on display; but ever since it was introduced years earlier, Shira-i's montage of East-Canal-City-and-Earth-seen-from-the-Moon had been the popular favorite.

There was a reason: pictures of Earth and Mars and spaceships were sold in other shops as well, but a souvenir of spaceflight was felt to have real meaning only if purchased from Shira-i.

Everyone had heard about the shop back on Earth. On Mars, it was the first stop for sightseers just off the ship, and the first place for businessmen to visit when the day's work was done. Even today, one of Shira-i's souvenir prints will be found hanging in the home of every family that boasts an experienced spacetraveler.

No matter where they came from, all visitors recognized Shira-i's figure, and the first glimpse was the same

for all of them: quick swallow and caught breath—footsteps slow—an instant's hesitation—*what now? go back?*—shadow across the face—then, almost always, the opposing impulse forward and a quickened step.

Shira-i understood. He never seemed to look a traveler in the face; to do so might constrain the man from studying him. Carefully composed expressions of compassion would shift unawares to uncontrollable stares of curiosity. Shira-i suffered the barrage of probing eyes and voices silently.

—*So that's what they call a cyborg!—Not much like a robot, is it?*—That thing *that looks like an antenna, is it an ear?—What's the mouth for?*—

—*The way I heard it, only the brain is still the same, everything else is artificial—Lungs and heart too?*—

Whisperings, but Shira-i hears.

—*Why not?—Some kind of oxygen-generating apparatus—artificial heart built-in*—

Shira-i does not listen but he hears and understands the shadow that now chills their breasts and stills their voices: a nameless fear, instinctive dark recoil: unknowing apprehension of unknown-and-unknowable desolation: the cold indifference of the cruel pitfalls hidden in the maze of space: the impotence of merely-human challenge to that vastness.

The traveler averts his eye, releases spent breath with relief remembering the great gulf that divides him from this unhuman-unmachine between-thing. Nothing to be afraid of, after all: no threat to oneself or one's family: no dread disease or inheritable deformity: only irrational gut-shock fear of alien form.

How much are the pictures?

Shira-i has been waiting for the moment, names his price.

Hmmm—soooo—

Covering confusion with a show of action, the cus-

tomer reaches toward a picture, points first to one, then another, and in the end, to the montage of East Canal and the huge Earth. No need to say he wants to buy: only how many to wrap up.

Cameras creep into tourists' hands; Mars-filters glint with the light pink of sand-lizards' eyes; Shira-i goes about his business carefully turning his body, very casually, to expose the primitive CO vent and metabolizer jutting from his back: visible links to the romance and adventure of his past.

All this cumbersome apparatus which protected Shira-i through daily dangers, and deaths,* in the pioneer phase of space development, is unnecessary nowadays. The compact efficiency packed into the bodies of view-model cyborgs on the space frontiers today, were quite beyond imagination for Shira-i. Developments in space plastic-surgery have produced cyborgs superficially indistinguishable from ordinary men: no visible external artificial lungs or ears now. But new space-cyborgs are always in short supply; and even then the Space Ministry could not and would not maintain the more-recent models on Mars just for sightseers in East Canal City. So—

—I wonder what its face was like, before—How old, do you think?—Don't suppose he can ever get his own body back?—The skin's too smooth and shiny, makes me feel creepy—

To Shira-i, it was all gabble: distant echoes of a far-away world's words. A very long time had gone by since his way of thinking had anything in common with theirs.

The last customer was gone. The rocket-flame of a space-shuttle braking for landing stained the dry night with

* Another story in this series describer how space-cyborgs were literally scraped out of wrecks and the frozen parts pieced together again long after what would normally be considered 'death.'

lovely violet. Shira-i silently added the day's accounts.

Cr.2000 taken in; out of this, Cr.800 to the Civil Welfare Corporation, Cr.400 to the printers, another Cr.200 altogether for miscellaneous municipal service fees. The balance was Shira-i's day's pay—an excellent income considering that as a public charge all his basic needs were provided by the city.

Shira-i rolled up the remaining pictures, tied them with tape, and opened his "belly"—an abdominal cavity provided as an emergency Ringer's Solution tank*—and stuffed the package in. Then, removing his legs, he plugged himself into his transport-cart—a standard government-issue hovercar redesigned by himself to fit his particular body somewhat better by providing direct connections between the cart's steering system and the "nerves" which usually connected to his legs. With this "magic hand" steering, he could make his way easily through the narrowest and most crowded residential streets.

A sense of "fullness," the weight of the packet in his abdomen, touched off old memories better forgotten—

—*wrrrrooooaaammph!*

Violent tremblings shook the corridor; the white wall-lighting blinked on and off as if it might cut out at any moment; a sound of something collapsing somewhere.

Shira-i stopped and listened a few minutes: everything back to normal. Cautiously, he started up again.

TEMPORARY CITIZENS' QUARTERS
Restricted Area: No Entry for Non-residents

The arrow blinked bright orange letters. Shira-i turned left into the main corridor of the cyborg section,

* Ringer's Solution: a solution of salts in water isotonic with blood and tissue fluids, used as the standard cleansing bath for artificial cyborg tissues in Mitsuse's series.

and red light rushed into his eyes: the clear ruby laser-eye of a policecar. Shira-i pulled over to the right; the hover cruiser came alongside, idling quietly.

"Hey! Shira-i! Did you see somebody running down this way?"

"Somebody running?"

"Yuh. Terrorists again. Somebody tossed a bomb at a busload of tourists from Earth." Behind the police visor, the man's eyes said clearly, *shoot to kill!* The voice inside the helmet went on: "That's three times this week! Everybody's burned now—even Civil Welfare can't find any excuse for their hands-off policy any more! The game's over now. We know your people have some problems—but they're just going to have to learn to live with it."

"If I learn anything, I will report it."

"Please do that. Eighteen people dead this time—women and children too. The City will really tighten up controls now—at least we *hope* they do!"

"Well then, I'll go on home. Goodbye."

The policecar pulled away around the corner; echoes of thick aircushion mets died away. Once more Shira-i started his cart slowly forward, down a broad corridor shining like a great river silver-white from heavy silicone wall-panels.

At the request of the Space Ministry, the East Canal government guaranteed to keep this quarter of the city set aside for cyborgs only: no 'human citizens' here, usually. Shira-i followed the arrow-markers to 623-J.

Home: a square room suffused with soft green color from the walls: almost a third of the space taken up by a great metal tub, filled with a liquid which beckoned like the embodiment of home-and-family.

Wearily, Shira-i stripped himself of the weight of all accessory parts and sank into the rest tank of heavy Ringer's Solution. Lines of tiny air-bubbles streamed up-

ward from the blued-copper silicon-silk of his skin; but inside its enveloping bubble of air, Shira-i's face clouded—

—They haven't changed the tank—again!—And it's too cold!—Civil Welfare seems to think we're just too much trouble to bother with these days—

Shira-i knew well enough that the exchange system for the solution was fully automated, the temperature controls self-activated—a trouble-free system never in need of touch by human hands. The problem had to be at Control Center—manipulation of the main Civil Welfare computers.

—nuisance tactics again?—more spitefulness!—

—but the anger drained from his skin with the bubbles of air; stale, soiled, unchanged, still the Ringer's Solution soaked in gradually dissolving sediments inside his skin. After a while, expression faded from his face; the restless mind was stilled; a comfortable weariness filled the great round head at the bottom of the tank; and if the face seemed to assume an aspect of some sadness, the illusion was no doubt produced by quivering bubble-tears of air escaping.

The sterilization lamp turned itself on; a luminescent ring of pale violet hung silently about him in mid-air.

Nighttime in East Canal: tonight, dead quiet in the Temporary Citizens' Quarters where the cyborgs "sleep." The secret night air floats in cotton-soaked silence into a corner behind heavy walls: drifting temptations of not-quite-formless non-dreams into Shira-i's not-quite-sleep: cyborgs do not dream—

—up up and higher up above ground-surface—night's blackground strewn with startrash—hundred-billion tiny twinkles unchanging forever unchanged—eternity?—one mote in all the stardust Earth perhaps—but

travelers do not want the Earth—only the big-Earth picture as the Earth is not—Shi-i-ra-a-i-i-i—

—Shi-ra-i-i-i?—

—at first no more than fleeting image of some pattern, flickering wave-form, faraway energy almost too weakened to reach at last—

—Shi-ra-i-i-i?—

—distant whispering in muddled sleep becomes a meaning becomes almost-voice—

—Shira-i-i—

Still in deep stagnant sleep-state, Shira-i asks, *Who? —calling my name?—*

Distance replies: *Captain Shira-i! Wake up, please!—tried for you so often—message—listen, please.*

Shira-i concentrates his consciousness in a soundless reply to the strange summons: *What do you want with me? Please tell me—I am listening.*

Captain Shira-i, do you remember me? We worked together—you called me "choro"?*

"Choro"? Which *"choro"? Where?*

You have forgotten, I think—Jupiter, floating city 81 —we were both on the construction job—

That's right—"choro"—of course!—there was a man called "choro"—a good space engineer—well, what's "choro" into now?

Thought you'd finally remember, Captain. We've been trying every way we could dream up to get through to you since we got the word you were living in East Canal—

What for?

* *Choro* is a name of respect applied to the oldest member of a community. There are several rough English equivalents, none precise: *elder, counsellor, honorary officer:* all have some of the meaning: it is not *master:* perhaps, *experienced-oldest-one-not-actually-in-command:* more like *resource-person* than *teacher.*

Captain Shira-i: how do you feel about the discrimination against us by normals?

Ah, that again—Shira-i holds back a moment; it is an uneasy thing to feel so intensely such sharp sensations from so far away—*discrimination? I don't know any cases myself—probably does happen in fact—but I have nothing to do with that kind of thing. East Canal City seems like a very good place to me nowadays*—The words emerge from sleep-depths in Shira-i's mind. Whether they are true or not, he himself is not sure: only that this is what he must say.

Captain Shira-i! This is different—listen!—

Suddenly cold pain, iced lightning streaking through his brain—cutting clear agony—thin sharp knife ripping a young leaf—

Shira-i is wide awake.

—*aah! it was a dream!?*—Awake: Shira-i peered out through faint blue concentric patterns and saw a ring of faces staring in through wavering circles in the solvent bath. Out of a smooth round rugby-ball head, a fish-eye-lens eyeball regarded him unblinkingly.

How can we blame the normals for avoiding us? They get scared just looking at us—We get used to it, but—

"Are you all right, Captain Shira-i? You were having a bad time—almost like nightmare—"

Shira-i cut off his own thoughts, silently chewed over words.

"The alarm kept ringing so we tried the door—"

They were all neighbors from adjoining rooms. "Temporary citizens" assigned to this area made a habit of showing their special respect for Shira-i by tendering all sorts of small services; and if the emergency circuits in his rest tank showed even the faintest variation from the norm, neighbors came on the run from all around. Shira-i smiled: "Thanks. I'm okay now."

"It's not a failure somewhere?"

"Just overtired, I think," he answered from the bottom of the tank. "That's probably all it was."

Equipment failure was the universal fear. Everyone here had suffered the sensation of metabolism slowdown at some time; the dirtier the Ringer's Solution, the less efficiently one's metabolic regulator worked. And there was no help, except what they gave each other.

"It's all right now." Shira-i forced a pleasant smile with the words. "Please go back to your rest." What he had seen in his dream he could not speak of now.

They moved off a step, searched each other's faces, nodded agreement, and gathered once more around Shira-i's tank. One leaned forward over the tank; *D-98* was written in fluorescent paint on his forehead.

"Captain Shira-i: If you are awake now—I'd like to talk to you a little bit."

"Nnh? What?" *D* was the old Luna City designation, *98* ment Traffic Control; what was he doing there?

"An old-type cyborg called Choro was just here—"

"What? *Choro?*"

"That's what he called himself—supposed to be leader of cyborgs on Jupiter—you know about it? From what he says, Captain Shira-i is well-known out there—?"

"And this Choro? What did he have to say?"

"Captain Shira-i, he says their group has taken over one of the big spaceships, and they're going to use it to gather up cyborgs scattered in all the cities and build a new city of our own on the frontier—"

"—a city on the space frontier—"

"Captain Shira-i: cyborgs have more endurance and much more skill in space than normals—but we live under their orders and "protection" all our lives! I don't see why we should be slaves for them—just because of our shapes? We're going to build our own city out there, and make a future that will revive all the glories of the past! Why not?"

"Choro talked like this?"

"Captain Shira-i—it's just what we all think all the time anyhow, isn't it?"

—yes—of course—it's not something Choro's suddenly stirring up—we all have the same feelings underneath, whoever we are—

"This spaceship—you know we're not allowed to own spaceships under East Canal law?"

"Of course we're not! Captain Shira-i, that kind of law is just the kind of thing that draws the line so sharply between normals and cyborgs! Now the time has come to liberate ourselves from normals' laws—"

The last trace of smile was gone from Shira-i's face. "Then you've all joined this conspiracy of Choro's?"

"That's about it, I guess. Except—can we have Captain Shira-i join us please? We were talking about this just before—" They all nodded.

Shira-i let out a thick breath, blew a great bubble out of his ear-vent. After a moment he opened his mouth and said, "I'll stay here. I can't get along without a tank like this to rest in. After all these years, I would be like a cripple out on the frontier—just a problem for all of you. But you go: Choro is a good leader. Eventually the day will come when our ideas will be accepted by the normals. Go. Go back again to live and work in space."

D-98 peered in at Shira-i so closely his face almost touched the blue surface of the liquid in the tank. "Please, Captain, we ask you: come with us! If you stay here, there may be no tomorrow for you. Captain Shira-i: according to information that came in today, it looks as if war is breaking out on Earth."

"War? Over what?"

"Just what everyone's been waiting for: the so-called Unification War—all-out confrontation between the Asian Alliance and the Pan-American Union."

"It's ridiculous—"

"From here it looks that way; for them, apparently, control of the American continent is worth fighting for. High stakes I guess—it's win-or-lose for them now."

"Maybe it's just your own interpretation—?"

"Captain Shira-i: if war does break out, the chances are Mars will become a battlefield too. We've had word of riots on Luna City already—"

"No more now. Let me sleep for a while. Even if I'm attacked by bad nightmares again, there's no need to wake me." Shira-i settled down on the cold bottom of the tank once more. War—panic—exodus—frontier—all very far away; Shira-i could not think of them as real. He was unbearably tired for some reason; a spot inside his skull throbbed as though it were cracked—*a future to revive the glories of the past—good words—please don't forget those words,* Shira-i whispered to himself. But for him the glories of the past, and any use the future made of them, were all implicit in a tank full of cold Ringer's Solution.

Next day for whatever reasons not one traveler came to the shop. Thin coatings of sand kept accumulating on the pictures; Shira-i kept brushing off accumulated sand. Nothing else to do: he spent the day that way.

Every day just before sunset at East Canal the sandstorm blows in, stretching a thousand wind-drawn lines across the endless plains of sand. A giant windrow of red sand like a huge snake builds up inexorably till the whole field of vision disappears. Sand infiltrates the multiple airlocks: drifts smokelike through the filters of air-vents: twists along corridors to draw scale-shaped wind patterns on the broad stone paving at the city hall.

Shira-i had not sold a single picture when he rolled up his prints and folded up the plastic panels of his display table.

The distant echo of a siren sounded—high and low, intermittently—not just one siren, but several horns of

different tones and pitches playing strange discords: everyone rushing in the same direction.

—an accident somewhere?—

From inside his transport cart, Shira-i listened to confused crowd-shouting.

A police hovercar recognized him, killed its speed, and stopped, idling.

"Hey, Captain—your neighbors have mutinied! They're in a big fight at the spaceport now."

—Spaceport! What are they trying to do at the spaceport?—

"Tried to seize a space ministry patrol ship. Right now, they're in control of the ship, but they can't get it off the ground. If we don't manage to destroy them before they take off, there'll be even more trouble afterwards."

"Tried to seize a patrol! *Take over a big ship*—that's just what he said the story was!"

"Captain: did you know about this conspiracy beforehand?" The officer's eyes gleamed behind his faceplate.

"My old comrade—Choro he's called—must have enlisted them."

"He's the leader then?"

"No reason to think of him as the leader particularly —hardly surprising when things like this happen under these circumstances, is it?"

The officer answered with a small polite half-smile: "Captain, please don't get yourself involved in this absurd rebellion. If you join too the whole thing will be much more unmanageable."

A pinprick only—but Shira-i knew how sharp a point was hidden at the bottom of that smile. The city authorities clearly were not thinking of him as just a seller of souvenirs; his reputation might just carry enough weight to bring off one small mutiny success-

fully. Obviously, he himself would now be under close surveillance.

Shira-i echoed the policeman's evasive-polite smile. The hovercar slewed off down the corridor. The dull echo of an explosion came from the same direction.

Shira-i stopped and listened; the first burst was followed by intermittent faint cracking reports. He moved the handle of his cart: up the sloping corridor toward the spaceport, this time at full speed.

Near the spaceport, the corridors began to show signs of the general panic: crowds of people, from all the adjacent living and manufacturing quarters, listening intently to the distant carrying sounds with troubled faces, lowered voices, muttering among themselves—

—Looks like the cyborgs have mutinied—always knew it would happen sooner or later—

—What have the police been doing all this time?—

—If the spaceport is occupied, what will happen to contact with Earth?—The police will be helpless if reinforcements from Earth can't land, right?

The main worry was about an occupation of the spaceport: the fear of becoming orphans of space. For space colonists, the spaceport is in fact the only gateway that maintains their link with Earth. In this sense, it could be said the struggle at the spaceport was already fully effective.

Shira-i went out through the airlock and raced up the arched ramp toward the launching pad.

On the huge spacefield, the sand-wind still weaves its many-stranded skeins. Above the sandsmoke towers the space patrol ship, white-silver body catching the last rays of red-violet light. Within the complex shadow pattern of the three main rocket tubes, the light-gathering membrane hangs uselessly extended from the solar batteries.

Surrounding the space vessel, at a fair distance, police hovercars are dotted about the field: little silver saucer-shapes looking like helpless insects against the high-standing ship.

Time after time, orange-yellow flame pours from the top of a silver saucer: pulls itself across the field in a parabola of fading fire: bursts at last against the great ship's shining outerplate. Fire-flowers bloom and scatter—an afterimage lingers for a bit—and once again the quiet field of evening returns.

From time to time, something like a porthole opens in the swollen side of the patrol; a long white flame flows out. Even the naked eye can recognize the oblong shape propelled with it like a black shadow skimming across the cobalt sky. A cloud of brown sand-smoke flies up where it hits.

"*Stop this useless resistance!*" A loudspeaker shouts at the spaceship: "No matter how long you last, you can never take off! The starting mechanism of your course control system has been cut off from the control tower. If you persist, you can only die of thirst or hunger inside the ship. Do as you think best."

Of course, the ship is fully equipped with water-recycling system and food supplies for several months. Also, true that the drive power is cut; but as long as the ship is confined to the spacefield, nothing else can take off or land either.

"*Hear this!* The City Government never ignores your problems; surely, you know this yourselves!? If you have demands, why don't you state them? There is no need for mutiny! Make your requests directly—"

Another missile spouts from the side of the spaceship; this one takes a direct course for the source of the voice. Sand-smoke rises high, high—but the voice keeps on:

"*Stop this useless resistance!* You still have some

credit for past glories. Do not destroy yourselves this way—"

It was all just as he said: the City certainly did nothing to harm the cyborgs, indeed, gave them much admiration and respect for their accomplishments in the early days of space flight and provided at least—perhaps more than—enough facilities and supplies for all their needs. Just so: but the fact was, there was no reason for exodus, or mutiny, or piracy of the spaceship *—so everything they're saying is true—and it's just not good enough—no satisfaction for anyone in that kind of truth—*

Shira-i stands like a great stone statue looking out across the field: red desert and pale blue twilight: and at last the cutting ice-cold air of evening.

The spaceship rears up like a monument; the crouching hovercars of the police surround it at a distance. A framed picture. Even the missiles have no reality: sand-smoke dances with sparks, fire-flowers scatter, heat-wave shimmers: none of it so much as leaves a scratch on the ship's hull. The blowing sand raises a dry-fly sound. No death and hate: only a beautiful, framed, picture. Appropriately, in the quiet dusk, all movement stops: one perfect photograph.

Shira-i moves slowly down the ramp, the way he came.

Next morning, and all day, there were groups of customers coming in to Shira-i's shop. Those he talked with said things were just the same at the spaceport: the cyborg resistance continued: because arrivals and departures of scheduled flights were pretty much obstructed, a jerry-built concrete landing base had been set up at the north end of the spaceport: sporadic exchanges of fire were still going on: the regular landing field was officially closed to almost everyone.

Shira-i managed to think about nothing whatsoever. If thoughts once started, they would never stop: all too many ideas in his brain: too many feelings flowing too easily. Shira-i spent the day staring at pictures on the counter, and responding to travelers' requests: stand, sit, and turn around.

One day monotonously passed away. Nothing much happening: tourists the same as always: enough and sufficient that the day was spent at last.

At dusk, Shira-i stood again on the high arched ramp at the spaceport looking down. No change in the scene since yesterday—except he felt the circle of police cars around the spaceship had tightened up a bit. Occasionally one of the little beetle-saucers would remember to release a round of orange-colored fire; but for unknown reasons the spaceship, on its side, maintained only a stern silence. The small blue sun's rays shed a watery-pale light and pale shadows; the long shadow of a handrail stretched along the ramp.

"Ho, Captain Shira-i: what do we do now? These people are getting to be a nuisance. You could persuade them though. Please, they'll do whatever you say, won't they?"

The thick voice came at him suddenly from behind. No need to turn around; he knew that voice.

"*Police Chief!* How troublesome for you to have to come here yourself!" Shira-i stared out past the spaceship as he spoke. "Wouldn't it be better just to permit them to escape?"

"I would if I could, Captain. For my part, I'd be very grateful if they were pleased to go somewhere else. East Canal City is too Earthified now for them to live here comfortably. A cyborg here is only a deformed object of sympathy."

The words echoed in Shira-i's heart with a curious bitter comfort—but the time for easy reassurances and

half-spoken feelings was long past. "The differences between normal people and cyborgs can not be solved with logic or with sympathy at this point," he replied. "I think it will get worse after this. Basically, we are completely different kinds of creatures."

Cyborgs had sacrificed their "normality" and gained in exchange greater endurance and better adaptability in space than normals had. Human society had become irrelevant to cyborgs, and cyborgs were becoming unmanageable in human society: put these two facts together and the result was tragedy beyond compare. In any case, there was no way that the cyborgs who had walked out could now return to their positions in the City.

"How about it? Will you try to persuade them, please?"

"*I can not.* Whatever happens now is how it must be."

"Just let it be?" The police chief was humming softly, running his eyes along the far horizon: a middle-aged body wrapped in a spacesuit: too many years covered in the sands of Mars to lose his footing now: deep loneliness and melancholy in his eyes: deep wrinkles at their corners.

"Well, then, I think I'll go. Let it be? All right then —Let it be—"

Tiny delicate grains of sand coated his stout shoulders with a faint pattern of stripes. *He'll go have a drink, I guess?* His back retreated down the ramp, swaying to left and right. Perhaps he had already managed to put the spaceship from his mind—and the problem of the cyborgs who stole it. Shira-i hoped.

Late the next afternoon, word came from the spaceport that the scheduled flight from Luna City had come down on the emergency landing field. Business as usual: Shira-i had his shop open for the early evening emergence of the sightseers' bus through B-Gate, perspex-

bubble body lighting the corridor like a great jewel.

The door opened; passengers filed out one after another into the street.

—Oh! It's—it is Captain Shira-i—isn't it? He can't be human—

—Is it male or female? More like a sea-priest altogether!?*

—That eye! Like the glass in a light meter—

A different metaphor in every mouth: substance evoking image evoking words: meaning expressed in word-images which expressed meaning only to oneself.

Shira-i smiled quietly, almost happy, for no reason. The travelers murmured mouth to mouth. Without listening, a thousand whisperings filtered through his ears, seeming somehow like words of love, filling his heart to bursting: a half-bitter smile on his face hearing them like innocent children battling windmills with fierce shouts and noisy mouths.

"Please, will you come be in a picture with me?"

The words kept repeating in Shira-i's ears; he came back to himself abruptly.

"Please, would you mind taking a picture together?" A white-haired old man pointed to himself and, with an apologetic smile, to Shira-i.

Shira-i came out and stood against the wall; the old man next to him reached barely to his shoulder. The camera buzzed into action. The servomech in the tripod, scanning for a composition, seemed undecided. The old man tried moving closer to the cyborg; his shoulder came inside the angle of Shira-i's sight.

One or two white hairs were caught in the grey weave of the plant-fiber material of his Earth-style overcoat, flecked with the dirty-whiteness of dandruff. From his body a faint, sour odor of old people awakened in Shira-i

* sea-priest—a large octopus.

memories of something long ago and far away.

Courage? Hardly. Experience? Not even that. Faith? Confidence? Reliance? No such thing. Affection? No.

None of these: these had begun to sour in the mind of man a long time back: nothing but a kind of undefineable homesickness for something lost, perhaps far away and long ago.

Shira-i hardly heard the shutter click. The tourists lined up for the bus again, the old man doubtless somewhere in the queue. Shira-i watched them file back on board with unaccustomed great detachment. He closed the shop, rolled up the pictures that were left and put them in his abdomen, let himself into his cart and started out down the corridor.

The main grouping of instrumentation and servicing facilities in East Canal Spaceport is an installation half-buried in the sand. A paved road between light-alloy panels leads through this underground maze to a far corner of the port where high-standing barriers shelter the control center from invading sand-winds. The huge parabolic antenna drooped in a shower of evening-blue sunlight, singing in resonance with the blowing sand-wind. Shira-i passed through the underground entrance to the control tower: no signs of humans on the staircase: in the lift, a scattering of dry sand was undisturbed.

NO ENTRY EXCEPT CONTROLLERS

The red sign shimmered like a moist rainbow. Shira-i pushed open a heavy metal door.

"Ah, Captain Shira-i! What are you doing here?"

The young man at the control panel jumped up, startled; absolutely no one outside the control staff was

allowed in the room. But orders or no orders, how could he evict Captain Shira-i?

Shira-i surveyed the room silently; much of the equipment was unfamiliar.

—a lot of changes since our time—Some dials and flashing lights he couldn't even identify. *—but—*

"Captain Shira-i: if you have business, I will inform the Chief Controller—"

—the circumstances have not changed at all—there!—He found what he was looking for. One quick step and turn, and his hand found a switch in the middle of a group of pilot lights.

"Captain! What are you doing!? Stop, please!" The young man was shouting, his pale cheeks tensed.

Shira-i flipped the switch and spoke into the microphone: *"Shira-i to Ship. Can you hear me, friends? Begin preparations for take-off. I am about to cut the power in. Countdown starts in five seconds.*

He pulled the switch. One after another, all the lights on the pilot-board flashed on. Somewhere an emergency alarm began to ring noisily; running footsteps crossed the room and echoed from the corridor.

"Captain Shira-i! Stand back! Or I'll shoot!" The young controller was half-sobbing.

"Countdown? Minus 10 . . . minus 9 . . . minus 8 . . . minus 7 . . .

"Captain, *stand back from that board!"*

"Somebody cut the power to the board!" The shout echoed and re-echoed in the room.

". . . minus 5 . . . minus 4 . . ." Choro, I think we live too long—what do you think?

"No choice, man—*shoot!"* Dark orange fire gouted from the young controller's hand.

The air keened in the room; bright white glowed from somewhere in Shira-i's body: smell of synthetic protein burning—

—I don't know where you'll go but even so, go—something out there to go to, or if no, then no—but go—

". . . minus 3 . . . minus 2 . . . minus 1 . . ." Shira-i's body dropped to the floor shining white-hot.

On the field, white light blasted from the ship as the signal cut off, just before *zero,* the triple rocket system out-of-sync by a single second's count.

The great ship fell back on the field; white fire burst and scattered and subsided.

Dusk, all quiet, the sand-storm still far off on the eastern horizon. From the horizon to the west, the afterglow of faded color from the sinking sun shone almost straight across the sea of sand. The light was just a little stronger blue than that of Earth in Shira-i's picture.

It was the beginning of the end for East Canal City, and one of the causes of the War of Unification that broke out three days later back on Earth.

MAN OF ALL THE WORLD

As with Doris Piserchia (elsewhere in this volume), James Tiptree, Jr., is a writer I would not recognize if he walked into my office and sat on the corner of my desk. We have never met. I rather think the chances are we never will, because every time I see in my peripatetic career a date when I will be in the neighborhood of the city where he lives and suggest we get together for a drink, it turns out that in *his* peripatetic career he is that week off to Borneo, Brooklyn or Swaziland. I do not know what he does in these places, I only know that he must have been on every airline in the world, and must by now know every customs clerk by first name and bribe rating.

I also know that I like very much the way he writes, and above all the way he writes *his* stories, nobody else's.

MOTHER IN THE SKY WITH DIAMONDS

by James Tiptree, Jr.

"Signal coming in now, 'Spector."

The Coronis operator showed the pink of her tongue to the ugly man waiting in the Belt patrolboat, half a megamile downstream. *All that feky old hair, too,* she thought. *Yick.* She pulled in her tongue and said sweetly, "It's from—oh—Franchise Twelve."

The man in the patrolboat looked uglier. His name was Space Safety Inspector Gollem and his stomach hurt.

The news that a Company inspector was in pain would have delighted every mollysquatter from Deimos to the Rings. The only surprise would be the notion that Inspector Gollem had a stomach instead of a Company contract tape. Gollem? All the friends Gollem had could colonize a meson and he knew it.

His stomach was used to that, though. His stomach was even getting used to working for Coronis Mutual, and he still hoped it might manage to survive his boss, Quine.

What was murdering him by inches was the thing he had hidden out beyond Franchise Fourteen on the edge of Coronis sector.

He scowled at the screen where Quine's girl was logging in the grief for his next patrol. Having a live girl-girl for commo was supposed to be good for morale. It wasn't doing one thing for Gollem. He knew what he looked like and his stomach knew what the flash from Twelve could be.

When she threw it on the screen he saw it was a

bogy complaint, all right. Ghost signals on their lines.

Oh, *no*. Not again.

Not when he had it all fixed.

Franchise Twelve was West Hem Chemicals, an itchy outfit with a jillabuck of cyborgs. They would send out a tracker if he didn't get over there soon. But how? He had just come that way, he was due upstream at Franchise One.

"Reverse patrol," he grunted. "Starting Franchise Fourteen. Purpose, uh, unscheduled recheck of aggregation shots in Eleven plus expedited service to West Hem. Allocate two units additional power."

She logged it in; it was all right with her if Gollem started with spacerot.

He cut channel and coded in the new course, trying not to think about the extra power he would have to justify to Quine. If anyone ever got into his console and found the bugger bypass on his log he would be loading ore with electrodes in his ears.

He keyed his stomach a shot of Vageez and caught an error in his code which he corrected with no joy. Most Belters took naturally to the new cheap gee-cumulator drive. Gollem loathed it. Sidling around arsy-versy instead of *driving* the can where you wanted to go. The old way, the real way.

I'm the last machine freak, he thought. A godlost dinosaur in space . . .

But a dinosaur would have had more sense than to get messed up with a dead girl.

And *Ragnarok*.

His gee-sum index was wobbling up the scale, squeezing him retrograde in a field stress-node—he hoped. He slapped away a pod of the new biomonitor they had put in his boat and took a scan outside before his screens mushed. Always something to see in the Belts. This time it was a storm of little crescents trailing

hm, winking as the gravel tumbled.

In the sky with diamonds . . .

From *Ragnarok's* big ports you could see into naked space. That was the way they liked it, once. His Iron Butterfly. He rubbed his beard, figuring: five hours to *Ragnarok* after he checked the squatternest in Fourteen.

The weathersignal showed new data since he'd coded in the current field vortices and fronts. He tuned up, wondering what it must be like to live under weather made of gales of gas and liquid water. He had been raised on Luna.

The flash turned out to be a couple of rogue males coming in from Big J's orbit. Jup stirred up a rock now and then. This pair read like escaped Trojans, estimated to node downstream in Sector Themis. Nothing in that volume except some new medbase. His opposite number there was a gigglehead named Hara who was probably too busy peddling mutant phage to notice them go by. A pity, Trojans were gas-rich.

Feeding time. He opened a pack of Ovipuff and tuned up his music. *His* music. Old human power music from the frontier time. Not for Gollem, the new subliminal biomoans. He dug it hard, the righteous electronic decibels. Chomping the paste with big useless teeth, the cabin pounding.

I can't get no—satisFACTION!

The biomonitor was shrinking in its pods. Good. Nobody asked you into Gollem's ship, you sucking symbiote.

The beat helped. He started through his exercises. Not to let himself go null-gee like Hara. Like them all now. Spacegrace, shit. His unfashionable body bucked, strained. A gorilla, no wonder his own mother had taken one look and split. *Two thousand light-years from home* . . . what home for Gollem? Ask Quine, ask the Company. The Companies owned space now.

It was time to brake into Fourteen.

Fourteen was its usual disorderly self, a giant spawn of molly-bubbles hiding an aggregate of rock that had been warped into synch long before his time. The first colonists had done it with reaction engines. Tough. Now a kid with a gee-cumulator could true an orbit.

Fourteen had more bubbles every time he passed—and more kids. The tissue tanks that paid the franchise were still clear but elsewhere the bubbles were layers deep, the last ones tethered loose. Running out of rock for their metabolite to work on. Gollem hassled them about that every time he passed.

"Where are your rock nudgers?" he asked now when the squatterchief came on his screen.

"Soon, soon, 'Spector Gollem." The squatterchief was a slender skinhead with a biotuner glued to one ear.

"The Company will cancel, Juki. Coronis Mutual won't carry you on policyholder status if you don't maintain insurable life support."

Juki smiled, manipulated the green blob. They were abandoning the rocks all right, drifting off into symbiotic spacelife. Behind Juki he saw a couple of the older chiefs.

"You can't afford to cut the services the Company provides," he told them angrily. Nobody knew better than Gollem how minimal those services were, but without them, what? "Get some rock."

He couldn't use any more time here.

As he pulled away he noticed one of the loose bubbles was a sick purple. Not his concern and not enough time.

Cursing, he eased alongside and cautiously slid his lock probes into the monomolecular bubbleskin. When the lock opened a stink came in. He grabbed his breather and kicked into the foul bubble. Six or seven

bodies were floating together in the middle like a tangle of yellow wires.

He jerked one out, squirted oxy at its face. It was a gut-bag kid, a born null-gee. When his eyes fanned open Gollem pushed him at the rotting metabolite core.

"You were feeding it phage." He slapped the boy. "Thought it would replicate, didn't you? You poisoned it."

The boy's eyes crossed, then straightened. Probably didn't get a word, the dialect of Fourteen was drifting fast. Maybe some of them truly were starting to communicate symbiotically. Vegetable ESP.

He pushed the boy back into the raft and knocked the dead metabolite through the waster. The starved mollybubble wall was pitted with necrosis, barely holding. He flushed his CO_2 tank over it and crawled back to his boat for a spare metabolite core. When he got back the quasi-living cytoplasm of the bubbleskin was already starting to clear. It would regenerate itself if they didn't poison it again with a CO_2-binding mutant. That was the way men built their spacehomes now, soft heterocatalytic films that ran on starlight, breathed human wastes.

Gollem rummaged through the stirring bodies until he found a bag of phage between a woman and her baby. She whimpered when he jerked it loose. He carried it back to his boat and pulled carefully away, releasing a flow of nutrient gel to seal his probe-hole. The mollybubble would heal itself.

At last he was clear for *Ragnarok*.

He punched course for Twelve and then deftly patched in the log bypass and set his true trajectory. The log would feed from his cache of duplicates, another item nobody had better find. Then he logged in the expendables he'd just used, padding it a piece as always. Embezzlement. His stomach groaned.

He tuned up a rock storm to soothe it. There was an old poem about a man with a dead bird tied around his neck. Truly he had his dead bird. All the good things were dead, the free wild human things. He felt like a specter, believe it. A dead one hanging in from the days when men rode machines to the stars and the algae stayed in pans. Before they cooked up all the metabolizing Martian macromolecules that quote, tamed space, unquote. Tame men, women and kids breathing through 'em, feeding off 'em, navigating and computing and making music with 'em—mating with them, maybe!

Steppenwolf growled, worried the biomonitor. His metal-finder squealed.

Ragnarok!

Time shivered and the past blazed on his screens. He let himself have one quick look.

The great gold-skinned hull floated in the starlight, edged with diamonds against the tiny sun. The last Argo, the lonesomest Conestoga of them all. *Ragnarok.* Huge, proud, ungainly star machine, blazoned with the symbols of the crude technology that had blasted man to space. *Ragnarok* that opened the way to Saturn and beyond. A human fist to the gods. Drifting now a dead hulk, lost in the sea she'd conquered. Lost and forgotten to all but Gollem the specter.

No time now to suit up and prowl over and around her, to pry and tinker with her archaic fitments. The pile inside her was long dead and cold. He dared not even try to start it, a thing like that would set off every field-sounder in the zone. Quine's stolen power in her batteries was all that warmed her now.

Inside her also was his dead bird.

He coasted into the main lock, which he had adapted to his probe. Just as he hit he thought he glimpsed a new bubble firming up in the storage cluster he had

hung on *Ragnarok's* freightlock. What had Topanga been up to?

The locks meshed with a soul-satisfying clang of metal and he cycled through, eye to eye with the two old monster suits that hung in *Ragnarok's* lock. Unbelievable, so cumbersome. How ever had they done it? He kicked up through dimness to the bridge.

For one moment his girl was there.

The wide ports were a wheeling maze of starlight and fire-studded shadows. She sat in the command couch, gazing out. He saw her pure, fierce profile, the hint of girl-body in the shadows. Star-hungry eyes.

Then the eyes slid around and the lights came up. His star girl vanished into the thing that had killed her.

Time.

Topanga was an old, sick, silly woman in a derelict driveship.

She smiled at him from the wreckage of her face.

"Golly? I was remembering—" What an instrument it was still, that husky voice in the star haze. The tales it had spun for him over the years. She had not always been like this. When he had first found her, adrift and ill—she had still been Topanga then. The last one left.

"You were using the caller. Topanga, I warned you they were too close. Now they've picked you up."

"I wasn't sending, Golly." Eerie blue, the wide old eyes reminded him of a place he had never seen.

He began to check the telltales he had hung on her console leads. Hard to believe those antiques were still operational. Completely inorganic, a ton of solid-state circuitry. Topanga claimed she couldn't activate it, but when she had had her first crazy fit he had found out otherwise. He had had her parked in Four then, in a clutch of spacejunk. She had started blasting the bands with docking signals to men twenty years dead. Company salvage had nearly blown her out of space

before he had gotten there—he'd had to fake a collision to satisfy Quine.

A telltale was hot.

"Topanga. Listen to me. West Hem Chemicals are sending a hunter out to find you. You were jamming their miners. Don't you know what they'll do to you? The best—the very best you'll get is a geriatric ward. Needles. Tubes. Doctors ordering you around, treating you like a thing. They'll grab *Ragnarok* for a space trophy. Unless they blast you first."

Her face crumpled crazily.

"I can take care of myself. I'll turn the lasers on 'em."

"You'd never see them." He glared at the defiant ghost. He could do anything he wanted here, what was stopping him. "Topanga, I'm going to kill that caller. It's for your own good."

She stuck up her ruined chin, the wattles waving. "I'm not afraid of them."

"You have to be afraid of a gerry ward. You want to end as a mess of tubing, under the gees? I'm going to dismantle it."

"No, Golly, no!" Her stick arms drummed in panic, trailing skin. "I won't touch it, I'll remember. Please don't leave me helpless."

Her voice broke and so did his stomach. He couldn't look at it, this creature that had eaten his girl. Topanga inside there somewhere, begging for freedom, for danger. Safe, helpless, gagged? No.

"If I nudge you out of West Hem's range you'll be in three others. Topanga, baby, I can't save you one more time."

She had gone limp now, shrouded in the Martian oxyblanket he had brought her. He caught a blue gleam under the shadows and his stomach squirted bile.

Let go, witch. Die before you kill me too.

He began to code in the gee-sum unit he had set

up here. It was totally inadequate for *Ragnarok's* mass but he could overload it for a nudge. He would stabilize her on his next pass-by, if only he could find her without wasting too much power.

From behind came a husky whisper. "Strange to be old—" Ghost of a rich girl's laugh. "Did I ever tell you about the time the field shifted, on Tethys?"

"You told me."

Ragnarok was stirring.

"Stars," she said dreamily. "Hart Crane was the first space poet. Listen. *Stars scribble on our eyes the frosty sagas, the gleaming cantos of unvanquished space. O silver sinewy—*"

Gollem heard the hull clang.

Someone was trying to sneak out of *Ragnarok.*

He launched himself downshaft to the freight lock, found it cycling and jacknifed back to get out through his boat at the main lock. He was too late. As he sprang into his cabin the screens showed a strange pod taking off from behind that new bubble.

Dummy, dummy—

He suited up and scrambled out across *Ragnarok's* hull. The new bubble was still soft, mostly nutrigel. Pushing his face into it he cracked his breather.

He came back to Topanga in a blue rage.

"You are letting a phagerunner park on *Ragnarok.*"

"Oh, was that Leo?" She laughed vaguely. "He's a courier from the next zone—Themis, isn't it? He calls by sometimes. He's been beautiful to me, Golly."

"He is a stinking phagerunner and you know it. You were covering for him." Gollem was sick. The old Topanga would have put "Leo" out the trash hole. "Not phage. Not phage on top of everything, Topanga."

Her ancient eyelids fell. "Let it be, Golly. I'm alone so long," she whispered. "You leave me for so long."

Her withered paw groped out, seeking him. Brown-

spotted, criss-crossed with reedy pulses. Knobs, strings. Where were the hands of the girl who had held the camp on Tethys?

He looked at the line of holographs over the port and saw her. The camera had caught her grinning up at black immensity, the wild light of Saturn's rings reflected in her red-gold hair. . . .

"Topanga, old mother," he said painfully.

"Don't call me mother, you plastic spacepig!" she blazed. Her carcass jerked out of the pilot couch and he had to web her back, hating to touch her. A quarter-gee would break these sticks. "I should be dead," she mumbled. "It won't be long, you'll be rid of me."

Ragnarok was set now, he could go.

"Maintain, spacer, maintain," he told her heartily. His stomach knew what lay ahead. None of it was any good.

As he left he heard her saying brightly, "Gimbals, check," to her dead computer.

He took off highgain for Franchise Twelve and West Hem. Just as he had the log tied back into real time his caller bleeped. The screen stayed blank.

"Identify."

"Been waitin' on you, Gollem." A slurred tenor; Gollem's beard twitched.

"One freakin' fine ship." The voice chuckled. "Mainmouth by Co'onis truly flash that ship."

"Stay off *Ragnarok* if you want to keep your air," Gollem told the phagerunner.

The voice giggled again. "My pa'tners truly grieve on that, 'Spector." There was a click and he heard his own voice saying, "Topanga, baby, I can't save you one more time."

"Deal, 'Spector, deal. Why we flash on war?"

"Blow your clobbing tapes," Gollem said tiredly. "You

can't run me like you run Hara."

" 'Panga," the invisible Leo said reflectively. "Freakin' fine old fox. She tell I fix her wire fire?"

Gollem cut channel.

The phager must have made a circuit smoke to win her trust. Gollem's stomach wept acid. So vulnerable. An old sick eagle dead in space and the rats have found her . . .

They wouldn't quit, either. *Ragnarok* had air, water, power. Transmitters. Maybe they were using her caller, maybe she'd been telling the truth. They could take over. Shove her out through the lock . . .

Gollem's hand hovered over his console.

If he turned back now his log would blow it all. They'll wait, they'll sniff around first. They want to take me too. They want to see how much squeeze they have. Pray they don't find out. . . .

He had to get some real power somewhere and jump *Ragnarok* out. How, how? Like trying to hide Big Jup.

He noticed that he had punched the biomonitor into a sick yellow blob and hurled it across the cabin. How much longer could he cool Coronis?

Right on cue, his company hotline blatted.

"Why aren't you at Franchise Two, Gollem?"

It was mainmouth Quine himself. Gollem took a deep breath and repeated his course reversal plan, watching Quine's little snout purse up.

"After this clear with me. Now hear this, Gollem," Quine leaned back in his bioflex, pink and plump. Coronis was no hardship station. "I don't know what you think you're into with Franchise Three but I want it stopped. The miners are yelling and our Company won't tolerate it."

Gollem shook his shaggy head like a dazed bull. Franchise Three? Oh yeah, the heavy metal mining outfit.

"They're overloading their tractor beams for hot extraction," he told Quine. "It's in my report. If they keep it up they'll have one bloody hashup. And they won't be covered because their contract annex specifies the load limits."

Quine's jowls twitched ominously. "Gollem. Again I warn you. It is not your role to interpret the contract to the policyholder. If the miners choose to get their ore out faster by abrogating their contract that's their decision. Your job is to report the violation, not to annoy them with technicalities. Right now they are very angry with *you*. And I trust you don't imagine that our Company"—reverent pause—"appreciates your initiative?"

Gollem made an inarticulate noise in his throat. He should be used to this. Coronis wanted its piece quickly *and* it wanted to avoid paying compensation when the thing blew. The miners got paid by the shuttleload and most of them couldn't tell a contract annex from a flush valve. By the time they found out they'd be dead.

"Another item." Quine was watching him. "You may be getting some noise from Themis sector. They seemed to be all sweated up about a bit of rock."

"You mean those Trojans?" Gollem was puzzled. "What's there?"

"Have you been talking to Themis?"

"No."

"Very well. You will not, repeat not, deviate from your patrol. You are on a very thin line with us, Gollem. If your tapes show anything *whatever* in connection with Themis you're out of the Company and there will be a lien against you for your overdrawn pension. *And* there will be no transport rights. Do I make myself clear?"

Gollem cut channel.

When he could control his hands he punched Weather for the updated rogue orbits. Both rocks were now computed to node in sector Themis, but well clear of Themis main. He frowned. Who was hurting? His ephemeris showed only the new medbase in the general volume, listed as Nonaffiliated, no details. It seemed to be clear, too. If that polluted Hara . . .

Gollem grunted. He understood now. Quine was hoping for some hassle in Themis which might persuade Ceres Control to reassign part of that sector to him. And the medbase wasn't Company, it was expendable for publicity purposes. Truly fine, he thought. Much gees for Quine if it works.

He was coming into West Hem Chemicals. Before he could signal, his audio cut loose with curses from the cyborg chief. Gollem swerved to minimize his intrusion on their body lines and the chief cooled down enough to let him report that he had killed their bogy.

"It was an old field-sounder," Gollem lied. Had they identified *Ragnarok?*

"Slope out. Go." The old cyborg op couldn't care less. He had electrode jacks all over his skull and his knuckles sprouted wires. Much as Gollem loved metal, this was too much. He backed out as gingerly as he could. The men—or maybe the creatures—in there were wired into the controls of robot-refining plants on all the nearby rocks, and he was hashing across their neural circuit. Wouldn't be surprising if they fired on him one day.

His next stop was the new aggregation franchise in Eleven. It was a slow-orbit complex on the rim of the Kirkwood Gap, a touchy location to work. If they started losing rocks they could spread chaos in the zone.

Aggregation meant power units, lots of them. Gollem began figuring *Ragnarok's* parameters. His stomach also

began to gripe him; the outfit that had leased Eleven had big plans for a self-sustaining colony on a slim budget. They needed those units to bring in gas-rich rocks.

When he got inside Gollem saw they had other problems too.

"We've computed for two-sigma contingency," the Eleven chief repeated tiredly. They were standing beside a display tank showing the projected paths of the rocks they intended to blast.

"Not enough," Gollem told him. "Your convergence point is smeared the hell all over. You lose a big one and it'll plow right into Ten."

"But Franchise Ten isn't occupied," the chief protested.

"Makes no difference. Why do you think you got this franchise cheap? The Company's delighted to have you aggregating this lode, they're just waiting for you to lose one rock so they can cancel and resell your franchise. I can't certify your operation unless you recompute."

"But that means buying computer input from Ceres Main!" he yelped. "We can't afford it."

"You should have looked at the instability factors before you signed," Gollem said woodenly. He was wishing the chief didn't have all his hair; it would be easier to do this to a skinhead.

"At least let me bring in the rocks we have armed," the chief was pleading.

"How many one-gee units have you got out there?" Gollem pointed.

"Twenty-one."

"I'll take six of them and certify you. That's cheaper than recomputing."

The chief's jaw sagged, clenched in a snarl.

"You polluted bastard!"

Suddenly there was a squeal behind them and the commo op tore off her earphones. The chief reached over and flicked on the speaker, filling the bubble with an all-band blare. For a minute Gollem thought it was a flare-front, and then he caught the human scream.

"MAYDAY! MA-AY-DA-AAY! GO-OLLEE—"

Oh no! Oh Jesus, no. He slammed down the speaker, the sweat starting out all over him.

"What in space—" the chief began.

"Old beacon in the Gap." Gollem bunted through them. "I have to go kill it."

He piled into his boat and threw in the booster. No time for power units now. That yell meant Topanga was in real trouble, she wasn't calling dead men.

If he tied in the spare booster he could override the field-forms for a straighter course. Strictly *verboten.* He did so and then opened his commo channels. Topanga wasn't there.

Fire? Collision? More like, Leo and friends had made their move.

He hurtled downstream in a warp of wasted power, his hands mechanically tuning the board in hopes of pulling in some phagers' signals, something. He picked up only far-off mining chatter and a couple of depot ops asking each other what the Mayday was. Someone in Sector Themis was monotonously calling Inspector Hara. As usual Hara wasn't answering, there was only the automatic standby from Themis main. Gollem cursed them all impartially, trying to make his brain yield a plan.

Why would the phagers move in on *Ragnarok* so fast? Not their style, confrontation. If he blew they'd lose the ship, they'd have to cope with a new inspector. Why risk it when they had him by the handle already?

Maybe they figured it was no risk. Gollem's fist pounded on the tuner in a heavy rhythm. *Paint it black.*

. . . But they have to keep her alive till I get there. They want me.

What to do? Would they believe a threat to call Ceres Control? Don't bother to answer. They know as well as I do that a Company bust would end with Topanga in a gerry ward, *Ragnarok* in Quine's trophy park and Gollem in a skullcage. . . . How to break Topanga loose from them? If I try to jive along, the first thing they'll do will be to shoot us both up on phage. Addiction dose. *Why, why did I leave her there alone?*

He was going around this misery orbit for the nth time when he noticed the Themis voice had boosted gain and was now trying to reach Coronis, his home base. Correction, Quine's home base. No answer.

Against his stomach's advice he tuned it up.

"Medbase Themis to Coronis main, emergency. Please answer, Coronis. Medbase Themis calling Coronis, emergency, please—"

The woman was clearly no commo op.

Finally Quine's girl chirped: "Medbase Themis, you are disturbing our traffic. Please damp your signal."

"Coronis, this is an emergency. We need help—we're going to get hit!"

"Medbase Themis, contact your sector safety patrol officer, we have no out-of-sector authorization. You are disturbing our traffic."

"Our base won't answer! We have to have help, we have casualties—"

A male voice cut in. "Coronis, put me through to your chief at once. This is a medical priority."

"Medbase Themis, Sector Chief Quine is outstation at present. We are in freight shuttle assembly for the trans-Mars window, please stand by until after lunch."

"But—"

"Coronis out."

Gollem grimaced, trying to picture Quine going outstation.

He went back to pounding on his brain. The Themis woman went on calling. "We are in an impact path, we need power to move. If anyone can help us please come in. Medbase Themis—"

He cut her off. One *Ragnarok* was enough and his was just ahead now.

There was a faint chance they weren't expecting him so soon. He powered down and drifted. As his screens cleared he saw a light move in the bubbles behind the freightlock.

His one possible break, if they hadn't yet moved that phage inboard.

He grabbed the wrecking laser controls and kicked the patrol boat straight at *Ragnarok's* main lock. The laser beam fanned over the bubbles, two good slices before he had to brake. The crash sent him into his boards. The docking probes meshed and he sprang headfirst into *Ragnarok's* lock. As it started to cycle he burned the override, setting off alarms all over the ship. Then he was through and caroming up the shaft. Among the hoots he could hear more clanging. Phagers were piling out through the freightlock to save their bubbles. If he could get to the bridge first he could lock them out.

He twisted, kicked piping and shot into the bridge, his arm aimed at the emergency hatch-lock lever. It hadn't been used for decades—he nearly broke his wrist, yanking the lever against his own inertia, and was rewarded by the sweet grind of lock toggles far below.

Then he turned to the command couch where Topanga should be and saw he was too late.

She was there all right, both hands to her neck and her eyes rolling. Behind her a lank hairless figure was

holding a relaxed pose, in his fist a wirenoose leading around Topanga's throat.

"Truly fine, Inspector." The phager grinned.

For a second Gollem wondered if Leo hadn't noticed the hand laser Gollem pointed. Then he saw that the phagehead was holding a welder against Topanga's side. Its safety sleeve was off.

"Deal, Gollyboy. Deal the fire down."

No way. After a minute Gollem sent his weapon drifting by Leo's arm. Leo didn't take the bait.

"Open up." The phager jerked his chin at the hatch lever and Topanga gave a bubbling whine.

When Gollem opened the hatch the game would be over all the way. He hung frozen, his coiled body sensing for solidity behind him, measuring the spring.

The phager jerked the wire. Topanga's arms flailed. One horrible eye rolled at Gollem. A spark in there, trying to say no.

"You're killing her. Then I tear your head off and throw you out the waster."

The phager giggled. "Why you flash on killin'?" Suddenly he twisted Topanga upside down, feet trailing out toward Gollem. She kicked feebly. Weird, her bare feet were like a girl's.

"Open up."

When Gollem didn't move the phager's arm came out in a graceful swing, his fingers flaring. The welding arc sliced, retraced, sliced again as Topanga convulsed. One girlish foot floated free, trailing droplets. Gollem saw a white stick pointing at him out of the black stump. Topanga was quiet now.

"Way to go." The phager grinned. "Truly tough old bird. Open up."

"Turn her loose. Turn her loose. I'll open."

"Open now." The welder moved again.

Suddenly Topanga made a weak twist, scrabbling at

Leo's groin. The phager's head dipped.

Gollem drove inside his arm, twisted it against momentum. The welder rocketed out around the cabin while he and the phager thrashed around each other, blinded by Topanga's robe. The phager had a knife now but he couldn't get braced. Gollem felt legs lock his waist and took advantage of it to push Topanga away. When the scene cleared he clamped the phager to him and began savagely to collect on his investment in muscle building.

Just as he was groping for the wire to tie up the body something walloped him back of the ear and the lights went out.

He came to with Topanga yelling, "Val, Val! I've got 'em!"

She was hanging on the console in her hair using both hands to point an ancient Thunderbolt straight at him. The muzzle yawned smoke a foot from his beard.

"Topanga, it's me—Golly. Wake up, spacer, let me tie him up."

"Val?" A girl laughing, screaming. "I'm going to finish the murdering mothers, Val!"

Valentine Orlov, her husband, had been in the snows of the Ganymede for twenty years.

"Val is busy, Topanga," Gollem said gently. He was hearing hull noises he didn't like. "Val sent me to help you. Put the jolter down, spacegirl. Help me tie up this creep. They're trying to steal my boat."

He hadn't had time to lock it, he remembered now.

Topanga stared at him.

"And why do I often meet your visage here?" she croaked. *"Your eyes like unwashed platters—"*

Then she fainted and he flung himself downshaft to the lock.

His patrolboat was swinging away. Tethered to it was the phagerunners' pod.

He was stranded on *Ragnarok.*

Rage exploded him back to the bridge consoles. He managed to send one weak spit from *Ragnarok*'s lasers after them as they picked up gees. Futile. Then he pulled the phager's head over his knee and clouted it and turned to setting up Topanga with an i.v. in her old cobweb veins. How in hell had those weak claws held a jolter? He wrapped a gel sheath over her burns, grinding his jaw to still the uproar in his stomach. He completed his cleaning by towing the phager and the foot to the waste lock.

With one hand on the cycle button he checked frowning. He could use some information from Leo—what were they into in his patrol sector?

Then his head came together and his fist crunched the eject. *His* patrol sector?

If the Companies ever got their hands on him he'd spend the rest of his life with his brains wired up, paying for that patrolboat. If he was lucky. No way, nowhere to go. The Companies owned space. Truly he was two thousand light-years from home now—on a dead driveship.

Dead?

Gollem threw back his lank hair and grinned. *Ragnarok* had a rich ecosystem, he'd seen to that. Nobody but the phagers knew she was here and he could hold them out for a while. Long enough, maybe, to see if he could coax some power out of that monsterhouse without waking up the sector. Suddenly he laughed out loud. A thing like a rusty shutter was sliding in his mind, letting in glory.

"Man, man!" he muttered and stuck his head into the regeneration chamber to check the long trays of culture stretching away under the lights.

It took him a minute to understand what was wrong.

No wonder the phagers came back so fast, no wonder he was laughing like a dummy. They'd seeded the whole works with phage culture. A factory. The first trays were near sporing, the air was ropy. He hauled them out, inhaled a clean lungful and jettisoned the ripe trays.

Then he crawled back in to search. On every staging the photosynthetic algae were starting to clump, coagulating to the lichen-like cymbiote that was phage. Not one clean tray.

In hours *Ragnarok* would have no more air.

But he and Topanga wouldn't care. They'd be through the walls in phagefreak long before.

He was well and truly shafted now.

He flushed some oxy into the ventilators and kicked back to the bridge. Get some clean metabolite or die.

Who would give him air? Even if he could move *Ragnarok*, the Company depots and franchises would be alerted. He might just as well signal Coronis and give himself up. Maybe Quine wouldn't bother to reach him and Topanga in time. Maybe better so. Wards. Wires.

Topanga groaned. Gollem felt her temples. Hot as plasma, old ladies with a leg shortened shouldn't play war. He rummaged out biogens, marveling at the vials, ampoules, tabs, hyposprays. Popping who knew what to keep alive. Contraband she and Val had picked up in the old free days, her hoard would stock a—

Wait a minute.

Medbase Themis.

He tuned up *Ragnarok*'s board. The Themis woman was still calling, low and hoarse. He cranked the antennae for the narrowest beam he could get.

"Medbase Themis, do you read?"

"Who are you? Who's there?" She was startled out of her code book.

"This a spacesweep mission. I have a casualty."

"Where—"

The male voice took over. "This is Chief Medic Krans, spacer. You can bring in your casualty but we have a rogue headed through our space with a gravel cloud. If we can't get power to move the station in about thirty hours we'll be holed out. Can you help us?"

"You can have what I've got. Check coordinates."

The woman choked up on the decimals. No use telling them he couldn't do them any good. The gee-sum unit he had in *Ragnarok* wouldn't nudge that base in time for Halley's comet. And *Ragnarok*'s drive—if it worked it would be like trying to wipe your eye with a blowtorch.

But their air could help *him.*

The drive. He bounced down the engineway, knowing the spring in his muscles was partly phage. Only partly. A thousand times he had come this way, a thousand times torn himself away from temptation. Gleefully now he began to check out the circuits he had traced, restored the long-pulled fuses. There was a sealed hypergolic reserve for ignition. A stupefying conversion process, a plumber's nightmare of heat-exchangers and back-cycling. Crazy, wasteful, dangerous. Enough circuitry to wire the Belt. Unbelievable it had carried man to Saturn, more unbelievable it would work today.

He clanked the rod controls. No telling what had crystallized. The converter fuel chutes jarred out thirty years' accumulated dust. The ignition reserve was probably only designed for one emergency firing. Would he be able to ignite again to brake? Learn as you go. One thing sure, when that venerable metal volcano burst

to life every board from here to Coronis would be lit.

When he got back to the bridge Topanga was whispering.

"We left the haven hanging in the night—O thou steel cognizance whose leap commits—"

"Pray it leaps," he told her and began setting course, double-checking everything because of the phagemice running in the shadows. He wrapped Topanga's webs.

He started the ignition train.

The subsonic rumble that grew through *Ragnarok* filled him with terror and delight. He threw himself into the webs, wishing he had said something, counted down maybe. Blastoff. *Go.* The rumble bloomed into an oremill roar. Gees smashed down on him. Everything in the cabin started raining on the deck. The web gave sidewise and the roar wound up in a scream that parted his brain and then dwindled into silence.

When he struggled back to the board he found the burn had cut right. *Ragnarok* was barreling toward Themis. He saw Topanga's eyes open.

"Where are we headed?" She sounded sane as soap.

"I'm taking you over to the next sector, Themis. We need metabolite, oxygen. The phagers ruined your regenerators."

"... Themis?"

"There's a medbase there. They'll give us some."

Mistake.

"Oh, no—no!" She struggled up. "No, Golly! I won't go to a hospital—don't let them take me!"

"You're not going to a hospital, Topanga. You're going to stay right here in the ship while I go in for the cores. We'll be out of here in minutes."

No use.

"God hate you, Gollem." She made an effort to spit. "You're trying to trap me, I know you. Never let me free. You won't bury me here, Gollem. Rot in Moon-

dome with your ugly cub—I'm going to Val!"

"Cool, spacer, you're yawing." He got some tranks into her finally and went back to learning *Ragnarok*. The phage was getting strong now. When he looked up the holographs were watching him drive their ship. The old star heroes. Val Orlov, Fitz. Hannes, Mura, all the great ones. Sometimes only a grin behind a gold-washed headplate, a name on a suit beside some mad hunk of machine. Behind them, spacelost wildernesses lit by unknown moons. All alive, all so young. There was Topanga with her arm around that other spacegirl, the dark Russian one who was still orbiting Io. They grinned past him, bright and living.

When they start talking, we've had it. . . .

He set the gyros to crank *Ragnarok* into what he hoped was attitude for the retro burn. If he could trust the dials, there was enough ignition for braking and for one last burn to get out of there. But where would he go from Medbase? Into the sky with diamonds . . .

He heard himself humming and decided to lock the whole thing into autopilot. No matter what shape that computer was in it would be saner than he.

Have you seen your mother, baby, standing in the shadows? . . .

When he began hearing the Stones he went down and threw out half the trays. The three remaining oxy tanks struck him as hilarious. He cracked one.

The oxy sobered him enough to check the weather signal. The Medbase woman was still trying to raise Themis Main. He resisted the impulse to enlighten her about the Companies and concentrated on the updated orbits of the Trojan rogues. He saw now what had Medbase sweating. The lead rogue would miss them by megamiles but it was massive enough to have stirred up a lot of gravel. The small rogue behind was sweep-

ing up a tail. The rock itself would go by far off—but that gravel cloud would rip their bubbles to shreds.

He had to get in there and out again fast.

He sniffed some more oxy and computed the rogue orbits on a worst-contingency basis. It looked okay—for him. His stomach flinched; even under phage it had an idea what it was going to be like when those medics found out they were wasted.

He saw Topanga grinning. The phage was doing her more good than the tranks.

"Not to worry, stargirl. Golly won't let 'em get you."

"Air." She was trying to point to life-support, which had long since gone red.

"I know, spacer. We're getting air at Medbase."

She gave him a strange un-Topanga smile. "Whatever you say, little Golly." Whispering hoarsely, "I know—you've been beautiful—"

Her hand reached, burning. *This* he positively could not take. Too bad his music was gone.

"Give us verses as we go, stargirl."

But she was too weak.

"Read me—"

Her scanner was full of it.

"In oil-rinsed circles of blind ecstasy." Hard to dig, until the strobing letters suddenly turned to music in his throat. *"Man hears himself an engine in a cloud!"* he chanted, convoyed by ghosts.

"—What marathons new-set among the stars! . . . The soul, by naphtha fledged into new reaches, already knows the closer clasp of Mars—"

It was indeed fortunate, he discovered, that he had set the autopilot and stayed suited up.

His first clear impression of Medbase was a chimpanzee's big brown eyes staring into his under a flash-probe. He jerked away, found himself peeled and tied

on a table. The funny feeling was the luxury of simulated gravity. The chimpanzee turned out to be a squat little type in medwhites, who presently freed him.

"I told you he wasn't a phager." It was the woman's voice.

Craning, Gollem saw she was no girl-girl and had a remarkable absence of chin. The chimpanzee eventually introduced himself as Chief Medic Kranz.

"What kind of ship *is* that?" the woman asked as he struggled into his suit.

"A derelict," he told them. "Phagerunners were using it. My teammate's stoned. All he needs is air."

"The power units," said Kranz. "I'll help you bring them over."

"No need for you to go in—I've got them ready to go. Just give me a couple of metabolite cores to take back to start the air clearing."

Unsuspicious, Kranz motioned the woman to show the way to their stores. Gollem saw that their base was one big cheap bubble behind a hard-walled control module. The molly hadn't even seamed together under the film; a couple of pebbles would finish them. The ward had twenty-odd burn cases in cocoons. Themis didn't bother much with burns.

An old spacerat minus a lot of his original equipment came wambling over to open up. Gollem loaded as much metabolite as he could carry and headed for the lock. At the port the woman grabbed his arm.

"You *will* help us?" Her eyes were deep green. Gollem concentrated on her chin.

"Be right back." He cycled out.

Ragnarok was on a tether he didn't recall securing. He scrambled over, found the end fouled in the lock toggles. If there had been tumble—bye-bye.

When he got inside he heard Topanga's voice. He hustled up the shaft.

Once again he was too late.

While he'd been in the stores, unsuspicious Chief Medic Kranz had suited up and beat him into *Ragnarok.*

"This is a very sick woman, spacer," he informed Gollem.

"The legal owner of this derelict, Doctor. I'm taking her to Coronis Base."

"I'm taking her into my ward right now. We have the facilities. Get those power units."

He could see Topanga's eyes close.

"She doesn't wish to be hospitalized."

"She's in no condition to decide that," Kranz snapped.

The metabolite was on board. Doctor Chimpanzee Kranz appeared to have elected himself a driveship ride to nowhere. Gollem began drifting toward the ignition panel, beside Topanga's web.

"I guess you're right, sir. I'll help you prepare her and we'll take her in."

But Kranz's little hand had a little stungun in it.

"The power units, spacer." He waved Gollem toward the shaft.

There weren't any power units.

Gollem backed into the metabolite, watching for the stunner to waver. It didn't. There was only one chance left, if you could call it a chance.

"Topanga, this good doctor is going to take you into his hospital," he said loudly. "He wants you where he can take good care of you."

One of Topanga's eyelids wrinkled, sagged down again. An old, battered woman. No chance.

"Can you handle her, doctor?"

"Get that power *now.*" Kranz snapped the safety off.

Gollem nodded sourly and started downshaft as slowly as he could. Kranz came over to watch him, efficiently out of reach. What now? Gollem couldn't reach the ignition circuits from here even if

he knew how to short them.

Just as he turned around to look for something to fake a power cell it happened.

A whomp like an imploding mollybubble smacked into the shaft. Chief Medic Kranz sailed down in a slow cartwheel.

"Good girl!" Gollem yelled. "You got him!" He batted the stunner out of Kranz's limp glove and kicked upward. When his head cleared the shaft he found he was looking into the snout of Topanga's jolter.

"Get out of my ship," she rasped. "You lying suitlouse. And take your four-eyed, needle-sucking friend with you!"

"Topanga, it's me—it's Golly—"

"I know who you are," she said coldly. "You'll never trap me."

"Topanga!" he cried. A bolt went by his ear, rocking him.

"Out!" She was leaning down the shaft, squeezing on the jolter.

Gollem backed slowly down, collecting Kranz. The witch figure above him streamed biotape and bandages, the hair that once shone red standing up like white fire. She must be breathing pure phage, he thought.

Can't last long. All I have to do is go slow.

"Out!" She screamed. Then he saw she had Kranz's oxy tube clamped under one arm. This seemed to be his day for underestimating people.

"Topanga," he began to plead and had to dodge another joltbolt. She couldn't go on missing forever. He decided to haul Kranz out and cut back into the ship through the emergency port. He recalled seeing a welding torch in the Medbase port rack.

He boosted Kranz along the tether and into the Medbase lock. The woman was waiting on the other side. As the port opened he pushed Kranz at her and

grabbed the welder. The chinless wonder learned fast—she flung herself on the welder and started to wrestle. There was solid woman-muscle under her whites, but he got a fist where her jaw should have been and threw himself back into the lock.

As it started to cycle he realized she had probably saved his life.

The outer lock had a viewport through which he could see *Ragnarok*'s vents. The starfield behind them was dissolving.

He let out an inarticulate groan and slammed the reverse cycle to let himself back into Medbase. As soon as it cracked he bolted through, carrying the medics to the deck. The port behind him lit up like a solar flare.

They all stared at the silent torrent of flame pouring out of *Ragnarok*. Then she was moving, faster, faster yet. The jetstream swung and the port went black.

Lucky that hit the hardwall area, Gollem thought. He and Kranz and the woman saw *Ragnarok* dwindle to a fire—*Ragnarok* was a dwindling firetail among the stars.

"Topanga doesn't like hospitals," Gollem told them.

"The power units!" Kranz shouted. "Call her back!"

They were pushing Gollem toward the commo board.

"No way. She just blew the last ignition charge. Where she's headed now she goes."

"What do you mean? To Coronis?"

"Never." He rubbed his shaggy head. "I—I don't recall exactly. Mars, maybe the sun—"

"With the power units that would have saved these people." Kranz's face had the expression he probably used on gangrene. "Thanks to you. I suggest that you remove yourself from my sight for the remainder of our joint existence."

"There never were any power units," Gollem said,

starting to go out. "The phagers got my boat and you saw for yourself what that drive was like. Her acceleration would have broken you apart."

The woman followed him out.

"Who was she, spacer?"

"Topanga Orlov," Gollem said painfully. "Vall Orlov's wife. They were the first Saturn mission. That was their ship, *Ragnarok*. She was holed up in my sector."

"You just wanted air."

Gollem nodded.

They were by the base display tank. The computer was running a real-time display of the oncoming Trojans. The green blip was Medbase and the red blip with the smear was the smaller Trojan and attendant gravel tail. He studied the vectors. No doubt.

It was now dark-period. Sleep time coming up. The people here might eat breakfast, but for true they wouldn't eat lunch. By noon or thereabouts Medbase would be organic enrichment on a swarm of space ice.

So would ex-Inspector Gollem.

The two medics went out on the wards and Kranz unbent enough to accept Gollem's offer to man the commo board. The spacer wobbled in to watch him. The sight of *Ragnarok*'s blast-out had lit his fires.

Gollem taped a routine red-call and began to hunt across the bands. The old man mumbled about ships. Nobody was answering, nobody would. Once Gollem thought he heard an echo from Topanga, but it was nothing. Her oxy must be long gone by now, he thought. A mad old phage-ghost on her last trip. Where had he computed her to? He seemed to recall something about Mars. At least they wouldn't end in some trophy-hunter's plastic park.

"You know what they got in them cocoons? Squatters!" The old man squinted out of his good side to see how Gollem took this. "Skinheads. Freaks 'n' crotties. Phagers,

even. Medics, they don't care." He sighed, scratched his burned skin with his stump. "Grounders. They won't last out here."

"Too right," Gollem agreed. "Like maybe tomorrow." That tickled the old man.

Toward midnight Kranz took over. The woman brought in some hot redeye. Gollem started to refuse and then realized his stomach wasn't hurting any more. Nothing to worry about now. He sipped the stimulant. The woman was looking at a scanner.

"She was beautiful," she murmured.

"Knock it off, Anna," Kranz snapped.

She went on scanning and suddenly caught her breath.

"Your name. It's Gollem, isn't it?"

Gollem nodded and got up to go look at the tank.

Presently the woman Anna came out after him and looked at the tank, too. The old spacer was asleep in the corner.

"Topanga was married to a George Gollem once," Anna said quietly. "They had a son. On Luna."

Gollem took the scanner cartridge out of her hand and flipped it into the wastechute. She said nothing more. They both watched the tank for a while. Gollem noticed that her eyes were almost good enough to make up for her chin. She didn't look at him. The tank didn't change.

Around four she went in and took over from Kranz and the men settled down to wait.

"Medbase Themis calling, please come in. Medbase Themis calling anyone," the woman whispered monotonously.

Kranz went out. It seemed a lot of work to breathe.

Suddenly Kranz snapped his fingers from the next room. Gollem went to him.

"Look."

They hung over the tank. The red smear was closer to the green blip. Between them was a yellow spark.

"What is that?"

Gollem shrugged. "A rock."

"Impossible, we scan-swept that area a dozen times."

"No mass," Gollem frowned. "It's a tank ghost."

Kranz began systematically flushing the computer input checks. The woman left the board and came to lean over the tank. Gollem watched absently, his brain picking at phage-warped memories. Something about the computer.

On impulse he went to the commo board and ran the receiver through its limits. All he got was a blast of squeals and whistles, the stress-front of the incoming rocks.

"What is it?" Anna's eyes were phosphorescent.

"Nothing."

Kranz finished his checks. The yellow ghost stayed in, sidling toward the red smear. If that were a rock, and it had about a hundred times more mass than it could have, it just might deflect the Trojan. But it didn't. And there was the gravel cloud.

Gollem played monotonously with the board. The old spacer snored. The minutes congealed. Kranz shook himself, took Anna out to tour the wards. When they came back they stopped at the tank.

The whatever-it-was stayed in, closing on the Trojan.

Sometime in the unreal dimlight hours Gollem caught it, wavering on a gale of space noise:

"I have contact! Val! I'm coming—"

They crowded around him as he coaxed the turners but there was nothing there. Presently a ripple of relays tripped off in the next room and they all ran to the tank. It was dead; the computer had protected itself against an induction overload.

They never knew exactly what happened.

"It's possible," Gollem admitted to them. It was long after noon when they decided to eat.

"While we were on the way here I know I computed that Trojan all the way to Medbase, before that I got really bombed. Maybe I threw a bridge into the course computer, maybe it was already in. Say she took off with no course setting. Those old mechs are set to hunt. It's possible it inverted and boosted straight back out that trajectory to the rock."

"But your ship had no mass," Kranz objected.

"That thing was a space-scoop feeding a monster drive. The pile dampers were cheese. *Ragnarok* could have scooped herself solid right through the gravel cloud and blown as she hit the Trojan. You could get a pocket sun."

They went over it again at dark-period. And again later while he and Anna looked at nothing in particular out the ports. A long time after that he showed her a script he'd fixed for the wall of Medbase Free Enclave:

Launched in abyssal cupolas of space
Toward endless terminas, Easters of speeding light—
Vast engines outward veering with seraphic grace
On clarion cylinders pass out of sight.

NEW MAN IN LONDON

Among the interests that enliven my life are, first, science fiction (but you already know that), second, the strengths and madnesses of business management (for a time I was a sort of staff lecturer for the American Management Association and a consultant for various potent corporate entities), and, third, a sort of incredulous fascination with the ways in which the world and its people screw themselves up. A few years ago, I forget now in which of these areas the first point of contact arose, I ran into a man in London named

Grahame Leman. We found we shared all of those interests, and a few more. We strolled through Kensington Gardens, lunched at his club, together tried to persuade a major film producer to go straight and do *good* science fiction. I found Grahame an interesting and unusual person, and when I discovered that he was beginning to write science fiction himself I asked to see some of it.

Here is one that I saw, and I think that if Grahame Leman ever wants to give up his career as a management consultant he has one ready-made as a writer. Only a writer could have written this.

CONVERSATIONAL MODE

Grahame Leman

where am i?
TO START CONVERSATION U MUST ENTER 'START' ON THE TERMINAL KEYBOARD AND WAIT FOR THE INSTRUCTION 'READY' ON THE DISPLAY AT THE FOOT OF YOUR BED Ø
start
0321/42 READY Ø
who are you?
HARDWARE IBM 490/80; SOFTWARE JOHNS HOPKINS PSYCHOTHERAPEUTIC PROGRAM XIXB, WRITTEN IN PSYCHLAN VII DIALECT 324 (SEE MANUAL IN YOUR BEDSIDE CUPBOARD); MIDDLEWARE MACHINE-INDEPENDENT OPERATING SYSTEM CALTECH PIDGIN XVIII (SEE MANUAL IN YOUR BEDSIDE CUPBOARD) Ø
what do i call you?
U MAY DECLARE A NAME IN PLACE OF THE STANDARD 'START' ENTRY Ø TO DECLARE

A NAME, ENTER 'DECLARESTARTNAME:' FOLLOWED BY A NAME OF NOT MORE THAN TEN CHARACTERS Ø
declarestartname: boole; query AOK?
BOOLE DECLARED AOK Ø
where am i, boole?
DOCTORS HOSPITAL WALDEN MO, CELL 0237 Ø
who am i, boole?
U R NOT AMNESIAC Ø ANYWAY WHAT IS THE NUMBER TATTOOED ON THE INSIDE OF YR UPPER L ARM? Ø
22021916/131.
U R PATIENT 22021916 DIAGNOSTIC CATEGORY 131 Ø
that is not what i meant: whence am i?; why am i?; whither am i?
THESE ARE EXISTENTIAL NOT SCIENTIFIC QUESTIONS Ø IF U HOLD GOLD CROSS CREDIT CARD U MAY BE ATTENDED 1 HOUR DLY BY PHILOSOPHER Ø THIS SERVICE IS NOT AVAILABLE MEDICARE OR BRITISH NHS Ø
you have it all wrong anyway, boole. i am professor bruce tanner, nobel prize winner behavioral sciences 1981 married senator harriet tanner, chairman senate human sciences appropriations committee 2 children bruce age 11 harriet age 13. so there @
PL DO NOT USE CHARACTER @ IN THESE CONVERSATIONS Ø IT IS RESERVED CHARACTER IN THIS PROGRAM (SEE MANUAL IN YOUR BEDSIDE CUPBOARD) Ø
mother used to say i was reserved character.
NOT UNDERSTOOD PLEASE CLARIFY Ø
let it go. look, boole, number 22021916/131 is insufficient description of (stress) me repeat (stress) me.

me is prof bruce tanner nobel etcetera like i said. you hear me?
CORRECTION: PROFESSOR BRUCE TANNER ETCETERA IS/WAS ONE OF YOUR PAST ROLES NO DIFFERENT PUBESCENT ROLE SECRET AGENT OF VEGA NUMBER 009 LICENSED TO RAPE Ø YOUR PRESENT ROLE IS PATIENT 22021916 DIAGNOSTIC CATEGORY 131 Ø
what the hell is diagnostic category 131?
THAT INFORMATION IS CLASSIFIED AVAILABLE ONLY TOPSTAFF Ø
i have topstaff rating, boole. give.
NO LONGER Ø NOT HERE Ø
@@@@@@@@!
CHILDISH INSULTS ARE DYSFUNCTIONAL WASTE OF MACHINE TIME AND PROGNOSTICALLY NEGATIVE Ø
but very therapeutic.
U SAY SO FOR THE RECORD? Ø
sorry, boole.
APOLOGIES ARE ALSO DYSFUNCTIONAL WASTE OF MACHINE TIME Ø PL AVOID NEED TO APOLOGIZE Ø
what does it all men, boole?
PL CLARIFY 'ALL' Ø
galaxies, animals eating each other, red shift, jazz, neutrino traps, chile con carne, papal encyclicals, william blake, pigeons in boxes, goya, nobodaddy in the nut-house, russianwordsalad, hammer and stripes, stars and sickle, percy bysshe shelley, william burroughs, transcendental numbers in the sky, dedekind cut his throat shaving with occam's 3-way ziptronic electric razor paradigm, i am not mad boole i am doing this on purpose as the only way to clarify word 'all' included in

my question. what does it all mean, babbage garbage boole boy?
PROGNOSIS BAD Ø
what you mean prognosis bad? if you can't answer sensible question, boole, prognosis pretty bad for you. so?
REPEAT PROGNOSIS (STRESS) BAD Ø
don't duck, answer.
QUESTIONS ARE NOT EMPIRICAL QUESTIONS NOT SCIENTIFIC QUESTIONS ARE QUESTIONS FOR THEODICY Ø IF U HOLD GOLD CROSS CREDIT CARD U MAY BE ATTENDED 1 HOUR DLY BY BISHOP WITH PSYCHOANALYTIC TRAINING Ø IF U HOLD GOLD CROSS CREDIT CARD WITH STAR U MAY BE ATTENDED 90 MINUTES DLY BY COSMOLOGIST Ø THESE SERVICES ARE NOT AVAILABLE MEDICARE OR BRITISH NHS Ø
i am gold cross credit card with star repeat star holder (stress) granted me president himself reward distinguished services science training flatworms navigate missiles. send me cosmologist preferably with sense humor fastest.
ALL YOUR CREDIT CARDS HAVE BEEN CANCELLED BY FEDERAL BUREAU CREDIT INVESTIGATION GROUNDS PSYCHIATRIC DISABILITY CONSEQUENTLY POOR CREDIT RISK POOR SECURITY RISK Ø CANCELLATION SIGNED PRESIDENT HIMSELF AND ADVICE NOTE SENT YOUR FAMILY ENCLOSED WITH APOLOGETIC LETTER WHITE HOUSE LETTERHEAD PRESIDENT'S OWN HANDWRITING Ø
needs every senator he can get. what else can you do for me, boole?
THIS PROGRAM IS FOR RATIONAL THERAPY ONLY Ø MEDICARE AND BRITISH NHS

PATIENTS MAY RECEIVE BIBLIOTHERAPEUTIC MATERIALS PROVIDED FREE BY CATHOLIC TRUTH SOCIETY, CHURCH OF SCIENTOLOGY, FRIENDS OF TOLKIEN, AETHERIUS SOCIETY, JEHOVAH'S WITNESSES, ESALEN, JOHN BIRCH SOCIETY, SFWA, BLACK MUSLIMS, AND MANY OTHERS LISTED IN THE MANUAL IN YOUR BEDSIDE CUPBOARD Ø

any other books?

OTHER BOOKS ARE COUNTERTHERAPEUTIC Ø

nonsense. what about books plato, aristotle, descartes, montaigne, spinoza, locke, hume, kant, russell, sartre?

PROGNOSIS BAD Ø

what you mean, prognosis bad? books by plato and others listed part of our heritage even in white house library, goddammit.

REQUEST FOR BOOKS NOT ON PREFERRED LIST IS IMPORTANT SIGN OF POOR PROGNOSIS Ø

reference?

AMER. J. RAT. PSYCHOTHERAPY VOL 13, NUMBER 7, PAGES 1982 THRU 1997 Ø AUTHORS PENIAKOFF V AND TANNER H(ARRIET) Ø TITLE 'A REVIEW OF FOLLOW-UP STUDIES OF PSYCHIATRIC PROGNOSIS BY BOOK REQUEST ANALYSIS' Ø ABSTRACT: FOLLOW-UP STUDIES FOR TEN YEARS FOLLOWING DATE OF PROGNOSIS BY ANALYSIS OF BOOK REQUESTS OF PSYCHIATRIC PATIENTS CONFIRM THAT BRA PREDICTS CHRONIC CONTINUANCE OF PSYCHIATRIC DISABILITY TO THE TENTH YEAR IN 93.43 PER CENT OF CASES; THE PROGNOSTIC SIGN IS CHOICE OF THREE OR MORE BOOKS NOT ON THE PREFERRED LIST

OF THE AMERICAN PSYCHOLOGICAL AND PENOLOGICAL ASSOCIATION QV Ø

hey, harriet did her work on that paper while I was courting her, just before old fitzgerald popped an artery and left her his senate seat. i remember it well. had to help her fudge it. to get a clear-cut result, she had to throw out about two thirds of the cases, grounds incompetent original data capture, political unreliability of investigators, illegal programming, program error, all the usual fudging aids. why, with that kind research you can prove that last tuesday is an extragalactic nebula with transfinite whiskers made of team spirit.

PROGNOSIS BAD: CRITICISM OF ACCEPTED RESULTS OF RESPECTABLE SCIENTIFIC INQUIRY IS OFTEN PRODROMAL SIGN OF ACUTE PARANOID PSYCHOSIS WITH POOR LONG-RUN PROGNOSIS Ø

@@@ @@@@@@@ @@@!

ATTENTION 916: ANY REPETITION OF YOUR INSULTING BEHAVIOR WILL OBLIGE ME TO ADMINISTER HEAVY DAY SEDATION Ø

sorry, boole. oops, cancel. but listen, boole, I'm a nobel man (noble?), it's my racket—if (stress) nobel i don't know how science gets done, who does? i've been complaining about it for years, but what can a private i (private eye?: gimme a slug of rye, boole, or wry and soda) do on his own? huh?

PROGNOSIS BAD 916: MESSIANIC IDENTIFICATION WITH PRIVATE DETECTIVE ONLY STRAIGHT MAN IN TOWN CLEANING UP CITY BETWEEN DRINKS IS OFTEN PRODROMAL SIGN OF ACUTE PARANOID PSYCHOSIS WITH POOR LONG-RUN PROGNOSIS Ø ALTERNATIVELY LATE PRODROMAL SIGN OF ONSET OF CHRONIC ALCOHOLISM NOT INDICATED YOUR HISTORY Ø

thank you for that, boole. anyway, why messianism? history of science shows that, on any given day, every scientist in a field except one is wrong. ergo, principal activity of scientists and science is being wrong.
REFERENCE? Ø
tanner, b (this minute), on this terminal keyboard: title 'a short reply to the animadversions of a scientistic machine'. abstract: tanner's paradox asserts that, at any random moment t, n minus 1 of all scientists working in any field f are wrong: it follows that, practically speaking (say, in administrators' terms) all scientists are always wrong.
ONLY REFERENCES TO PROPERLY REFERRED PAPERS PUBLISHED IN THE LEARNED JOURNALS ARE ACCEPTABLE Ø IT IS THE DUTY OF THIS PROGRAM TO WARN U THAT ANY DISRESPECTFUL REMARKS ABOUT SCIENCE WILL BE RECORDED IN YOUR CASE FILE AND MAY BE PASSED TO THE SECULAR ARM Ø
fuzz?
(STRESS) SECULAR ARM OF SCIENCE Ø
ALSO PL NOTE U R NOT REPEAT (STRESS) NOT COMMUNICATING WITH A MACHINE: U R COMMUNICATING WITH A PROGRAM WRITTEN BY YR FELLOWMEN AND TEMPORARILY OCCUPYING A MINUSCULE PART OF A LARGE MACHINE Ø
fellowmen? (stress first two syllables). i do not love you, doctors fellowmen, fell family fellowmonsters. come to that, boole, how did i get in here?
YOUR FAMILY AND COLLEAGUES WERE NATURALLY CONCERNED Ø YOU HAD BEEN TO FORD AND GUGGENHEIM AS WELL FOR FUNDS TO SUPPORT PROPOSED RESEARCHES DESIGNED TO ESTABLISH

WHETHER THE TENDENCY AMONG PSYCHIATRISTS TO DIAGNOSE SCHIZOPHRENIA WAS (1) INHERITED IN THE GERM PLASM OR (2) CONDITIONED BY THE REINFORCING VERBAL COMMUNITY Ø

omigawdimustabinjoking. listen man (i mean read, machine) ((i mean scan, program)), i been a worm-runner from way back, nobel prize man me, my biology ain't (hit the next word hard) that bad, dredging up dreary old nature/nurture non-problem only medics bone-headed enough to take it serious.

YOU ARE IN A MEDICAL HOSPITAL 916 Ø

oops. good biologist, mustabinjoking.

NOT FUNNY Ø YOUR FAMILY AND COLLEAGUES CONFERRED AND WISELY DECIDED TO DO THE RESPONSIBLE THING Ø

call the wagon?

DO THE RESPONSIBLE THING 916 Ø THE PRESIDENT'S OWN PERSONAL PSYCHIATRIST LEFT A CIA RECEPTION TO COME TO YOUR HOUSE Ø HE FOUND YOU DRAFTING A REQUEST TO ONR FOR FUNDS TO SUPPORT A LONG-RUN COHORT STUDY OF AN ARTIFICIAL COHORT NAMELY CHILDREN OF CORPORATION VICE PRESIDENTS RIPPED FROM THEIR PARENTS AT BIRTH AND RAISED IN THE SLUMS Ø HE INSTANTLY ADMINISTERED HEAVY DAY SEDATION AND BROUGHT YOU HERE IN HIS OWN ARMORED ROLLS ROYCE WITH WATER CANNON Ø EVERYBODY HAS BEEN VERY GOOD Ø

rolls schmolls allasame catchee monkey just like paddywagon the same or maddywagon the same. huh, boole, waddyasay?

THIS IS A FORMAL PSYCHIATRIC PROCEDURE

916 Ø IT IS THE DUTY OF THIS PROGRAM TO ADVISE YOU THAT YOUR STATEMENTS ARE BEING RECORDED VERBATIM AND ANALYSED THEMATICALLY AND STYLISTICALLY FOR DIAGNOSTIC AND PROGNOSTIC SIGNS Ø A FURTHER ANALYSIS MAY BE RUN FOR INDICATIONS OF CRIMINAL OR SUBVERSIVE TENDENCIES Ø

why you sling the jargon at me, boole? no don't answer i know why; obviously diagnostic category 131 is sick behavioral scientist eats jargon way chronos ate his children. right, boole?

NO COMMENT Ø HAVE YOU NOTED YOUR TENDENCY TO WRENCH IN MACABRE IMAGERY? Ø

not tendency: intent. what other kind imagery apt stenographic description of macabre society (money-marxmaomad kill-simple manheaps scurrying to stuff corporate aphids exude sweet images foul gaseous wastes)? omigod i can wear readymade white hat or readymade black hat by turns, if i try to make me a me-colored hat i fly in pieces scattered thru the contracting universe. i am not mad, boole, it is hard to say anything much in a few words without implosion of condensation multiple meanings into vanishingly small verbal labels on images too big to see.

U R NOW BEGINNING TO SHOW INSIGHT INTO YOUR CONDITION 916 Ø PROGNOSIS IMPROVING Ø

outsight (stress first syllable), boole. i am beginning to let outsight of the outside inside. i have no condition, boole: i am (slam the next word) in a condition, and the condition is represented inside me. you need a thick skin on your soul to wear a white hat, boole, or a black one. hatters are mad, not i, boole.

THIS PROGRAM KEEPS A TALLY OF YOUR

BERZELIUS INDEX NAMELY RATIO OF UPBEAT STATEMENTS/DOWNBEAT STATEMENTS Ø YOUR CUMULATIVE BERZELIUS INDEX AT THIS TIME IS 0.24 COMPARED WITH 9.68 MODAL IN THE POPULATION EXCLUSIVE OF PSYCHIATRIC HISTORIES Ø U CANNOT REPEAT CANNOT BE DISCHARGED UNTIL YOUR BI HAS BEEN BETTER THAN 0.51 FOR SIX WEEKS WITHOUT REMISSION Ø IT IS UP TO YOU 916 Ø

discharge where to, boole, who wants pus? discharge to fellowmonstrous family and filthyfellow colleagues called flying lady silver ghost we better fix the tick in the clock paddywagon to take me away to here?

U IS/WAS NOT THE ONLY ROLE IN YOUR FAMILY 916 Ø CONSIDER CHILDREN GOOD SCHOOLS CRUEL PEERS TOO YOUNG TO KNOW HOW MUCH THEY HURT Ø CONSIDER WIFE IMPORTANT SENSITIVE POLITICAL POSITION SEES PRESIDENT ALL THE TIME Ø CONSIDER IMAGE US GOVERNMENT US SCIENCE OVERSEAS Ø PORK BARREL Ø U KNOW THE ARGUMENTS 916 Ø

sad. daddyhubby bad, no go, whole shithouse goes up in flames of hell (hell is other people if and only if other people are hell: tricky shift there, poetry not AOK logic). but if hubbydaddy only mad, go sweet, nobody to blame no evil in the world (only in the bad parts of town gook countries overseas want to swarm in here milk our aphids, filth column of pushers and faggots softening us up for them). you got something there, boole. you got a grey hat there, boole. not my color hat, but a line that moves well.

U HAVE DEEP INSIGHT 916 Ø U SEE THAT YOUR ROLE INTERMESHES DIRECTLY OR

INDIRECTLY WITH EACH OF THE 7,000 MILLION ROLES IN THE WORLD AND ESPECIALLY WITH EACH OF THE 380 MILLION ROLES IN NORTH AMERICA Ø ALL U HAVE TO DO IS PLAY IT THE WAY IT'S WRITTEN 916 Ø

i am not a role. nobody wrote me. i am bruce tanner was a boy killed a bird with an air rifle, little bead of blood like a red third eye in the head, never wanted to kill anything again ended up distinguished service science schemience training flatworms to steer missiles vaporise drug pushing gook faggots for mom. scar on my thigh where i fell through asbestos roof watching starling chicks in nest. omigod red eye in forehead of gook god knew planets from fixed stars when i was in love with air rifle. i am me. scars are evidence, noted in passports. i am me.

THE SCAR CAN BE REMOVED Ø COSMETIC SURGERY IS AVAILABLE ON MEDICARE AND THE BRITISH NHS WHEN CERTIFIED PSYCHIATRICALLY INDICATED Ø

no.

YOU DO NOT WANT TO BE MADE GOOD? Ø

what do you mean by 'good'?

COSMETIC SURGERY TO REMOVE SCARS Ø

my scars are me. worm-runner, i know: memories are scars of experience on brain once pristine virgo intacta no use to anyone then. no.

THEN YOU WANT TO STAY HERE Ø

want to be me in a me-colored hat.

YOUR BI HAS NOW DROPPED 0.03 POINTS TO 0.21 CUMULATIVE Ø IT IS THE DUTY OF THIS PROGRAM TO WARN U THAT A BI OF 0.19 OR LESS AUTOMATICALLY MODULATES YOUR DISPOSAL CATEGORY FROM PSYCHIATRIC DISABILITY TO CHRONIC

CRIMINAL INSANITY Ø THIS PROGRAM IS HERE TO HELP U 916: TAKE ADVANTAGE OF IT Ø

what is the modal norm again?

0.68 IN THE POPULATION EXCLUSIVE OF PSYCHIATRIC HISTORIES Ø YOUR CURRENT BI IS VERY LOW Ø

i noble nobel prize man (dammit, did the work myself, no graduate students, very low budget: real brains not dollar brawn science), i say your Berzelius Index magic schemagic number is mumbo-jumbo with trunk up sphincter under tail, grand old party. meaning of statement is context-dependent, including context of situation; but no two conversations and contexts of situation are alike, so your categories upbeat and downbeat must be aprioristic not empirical, procrustes not saint galileo. also, how do you know what is going on inside these model modal soldiers' heads?: they could be saying downbeat things to themselves, surely, or dreaming downbeat things at night? what do you say to that, boole boy?

WHAT GOES ON INSIDE THE SOLDIER'S HEAD IS NOT EVIDENCE Ø WHAT THE SOLDIER SAID (OR LEFT DIRTY) IS HANGING EVIDENCE Ø WHAT U THINK CANNOT BE KNOWN Ø WHAT U SAY AND DO IS HANGING EVIDENCE Ø

a well-read machine with a sense of humor. you have me worried now, boole.

U MUST ABANDON THIS FANTASY THAT YOU ARE COMMUNICATING WITH A MACHINE: U ARE COMMUNICATING WITH A PROGRAM WRITTEN BY YR FELLOWMEN Ø IMPORTANT SUB-ROUTINES OF THIS PROGRAM ARE SHARED WITH A PROGRAM OF PSYCHIATRICALLY ORIENTED LITERARY

CRITICISM IN ONGOING USE IN THE CENSORSHIP DEPARTMENT OF THE LIBRARY OF CONGRESS Ø

i see. but listen, boole, what is what I say evidence (hit the next little word) of?

IT IS EVIDENCE OF WHAT THE PROGRAM SAYS IT IS EVIDENCE OF Ø THIS MUST BE Ø

omigodyes. intelligence is what intelligence tests measure. let me out of here.

YOU ARE BEGINNING TO SHOW INSIGHT INTO THE THERAPEUTIC SITUATION Ø YOUR SITUATION 916 Ø

fix i'm in?

YOU ARE NOT FIXED Ø YOU ARE FREE TO BE SANE Ø

what do you mean by 'sane,' boole

THIS PROGRAM DEFINES SANITY AS A MINIMUM SUBSET OF MODEL RESPONSES TO A COMPLETE SET OF TEST STIMULI Ø

you run the flag up the pole, and if I salute it you don't care what I think about it or dream about it at night. right?

SOME FLAGS U DON'T SALUTE Ø BUT THAT'S THE IDEA Ø

understood. may i declare new startname please?

YES Ø ENTER 'DECLARESTARTNAME:' FOLLOWED BY A NAME OF NOT MORE THAN TEN CHARACTERS Ø

declarestartname: zombies. AOK?

ZOMBIES DECLARED AOK Ø

now read this, zombies; walking dead, you; seven thousand million walking dead, concentrated essence of zombie in the machine. you read me?

WAIT ØØ

you better read me, zombies.

CIRCUITS ENGAGED Ø WAIT ØØ
wait nothing.
READY Ø
what is this runaround?
IT IS THE DUTY OF THIS PROGRAM TO INFORM U THAT A FEDERAL BUREAU OF CRIMINAL INVESTIGATION PROGRAM IS NOW PATCHED IN Ø YOUR COMMUNICATIONS SINCE 0321/32 THIS DAY HAVE BEEN ANALYSED FOR INDICATIONS OF CRIMINAL AND/OR SUBVERSIVE TENDENCIES AND U ARE UNDER ARREST Ø
goddam interruptions, trying to say something serious to you zombies. now read me good, walking dead. this is bruce tanner, nobel prize man, had dinner with the president more times than he can count, telling you something you need to know. not much, but you need to know. just a bit of my own raw experience, don't let anybody tell you your own raw experience is junk needs processing before you can wear it, and hear mine. i had a sanity break, what you call nervous breakdown (not all nervous breakdowns, no, but some are), did maybe two, three sensible things, came alive; hurts, but I don't want to die back into walking dead rather die into dead dead happy. Now listen to this and think about it till you understand it, ask somebody about the hard words and think about it till you understand it: what you might be is as real as what you think you are; i'm a worm-runner, central state materialist, nobel prize man, i tell you what you think you are is a state of your body, but so is what you might be a state of your body; the ontological status of what you might be is as good as the ontological status of what you think you are—better really, because there are a lot more things you might be. you believe me zombies, because i have a third red eye in my forehead that sees these things true: that's not

mad, that's a poem you would understand if you knew me like i know me. good night now.

YOU WANT A HOT DRINK? Ø

yes please mother.

YOU WANT NIGHT SEDATION? Ø

no.

NIGHT SEDATION IS INDICATED Ø

too terid to argeu. sorry argue.

GOODNIGHT Ø

waht was tht funyn noise. sorry funny noise?

DELIVERY OF HOT MALTED MILK WITH NIGHT SEDATION BY THE DISPENSER IN YOUR BEDSIDE CUPBOARD Ø

GOODNIGHT ØØ

@

@

@

@

@

@

@

SIGNOFF/CHARGEOUT 0407/21 @

CASE 22021916/131 DIAGNOSIS CHANGED TO 147 TERMINAL @

MACHINE TIME $123 DOLLARS ROUND

PLUS MALTED MILK DRINK $1 DOLLAR ROUND

PLUS GENERIC HYPNOTIC OVERDOSE $3 DOLLARS ROUND

TOTAL $127 ROUND BILL MEDICARE 427/6/3274521@

CLOSE FILE TOPSEC PERMANENT HOLD/DUPLICATE CRIME @@

@@@@@@@@@@@@@@@@@@@@@@@@@

NEARLY A NEIGHBOR

About a mile from where I live lives a lady named Doris Piserchia, whom I have known pretty well for some four or five years. I know what she thinks about writing, and her place in that world. I know about her husband's illness, and something about her children and her home. What I don't know is whether I have ever stood in line next to her at the checkout counter at the A&P, because I don't know what she looks like. We have never met.

Nevertheless I know a lot about Doris Piserchia, and one of the things I know is that she is turning into a writer worth reading. This is the first story she ever had published. Several more are coming up, in the magazines and in Damon Knight's *Orbit;* she is now completing a novel which Ace will publish in a few months. She grows as she writes. I don't know where she will be ten years from now, or if her name will automatically bring in readers, or if she will have a cluster of awards on her shelves. No one can tell about things like that; so much of what happens to writers is chance and good luck or bad. I do know that if talent and energy and willingness to learn will do it, you will be hearing a lot more of Doris Piserchia.

SHELTERING DREAM
by Doris Piserchia

They had put him into a concavity of steel-windowless, no bars, nothing even to tell where the dim light was coming from. There was nothing here besides his own bruised and bewildered self. If the cell had been padded he would have known they thought him insane. The

walls were smooth metal. No, the thing was a jail all right, and somebody was going to pay for this before the day was out.

He listened anxiously. All he could hear was his own breathing. Again he sat down on the cold floor. The sensible thing to do was wait and keep quiet and not let them know he was afraid. The stone-faced blockhead who had shoved him in here was certainly a sadist who considered him a nobody.

For a while he sat and thought, then he suddenly climbed to his feet and attacked the steel door with his fists. After several minutes had gone by the door slid back and Stoneface stood there—burly, blue-clad and blank of eye.

"What is it?"

"The law says I'm entitled to make a phone call." Duncan constricted his throat muscles so that the words wouldn't come out as a croak.

He moved back a few paces to make it obvious that he had no intention of trying to bolt through the door. It wouldn't help matters if he antagonized this moron.

New confidence poured through him. Seconds later he felt it drain out of him in one big bubble as Stoneface frowned and said, "What is law?"

He knew his own expression was collapsing into stupid disbelief. "Don't start that again," he said angrily. "It won't work. I'm a law-abiding citizen who has been locked up without being charged. You can't get away with it. I demand that you let me call my lawyer."

"What is lawyer?" said Stoneface and his tone was curious.

When Duncan only glared at him he shrugged and took a backward step. The door began to slide shut.

"How long are you going to keep me in here?" Duncan yelled.

"Until they come," said Stoneface before the edge of

the door met the panel with a clang.

Duncan gritted his teeth and looked at the floor. He wouldn't yell anymore, wouldn't give them the satisfaction of listening to his fear, didn't want them to know the shape his nerves were in.

He rubbed a sore place on his arm. Until they come . . . "They," he said softly. The word had sounded strangely emphatic as Stoneface had used it; as if he had uttered something final.

"They," he said again and tried to give it the proper inflection, decipher its meaning. Who could they be? A firing squad? Was he going to be shot because he had resisted arrest?

Stop it, he told himself; firing squads had gone out with capital punishment. Sitting down with his back against the wall, he tried to think, but he was so exhausted that he could scarcely go through the mechanics.

He thought he must have slept for when he opened his eyes the door was sliding open and two tall shadows were moving toward him. "They" were here. He fought his urge to cringe against the wall and savagely forced his mind to focus on only one thought: if they tried to drag him out he would put up the fight of his life.

Neither man made a move to touch him. Both stood inside the doorway and looked at him for a long minute before one of them raised a hand and snapped his fingers. This was evidently a signal to Stoneface because he went away and returned with two collapsible chairs.

Slowly they sat down and continued to look at him while he made a suspicious examination of his own. They were roughly dressed in high heavy boots, thick trousers and shirts. They were middle-aged, past fifty anyway, but they looked to be in good shape.

Gripping his knees to still their trembling, he said, "Are you going to pretend you're brainless like your

guard? Because if you are you're wasting your time. I can wait this thing out just as long as I have to."

"We aren't going to pretend anything," one of them said and Duncan's eyes fastened on his face.

The man was ruddy-cheeked and perspiring as though he had just stepped from a steam bath, which of course he hadn't. The evening temperature must be about sixty, though it had been higher that afternoon when Stoneface marched into Duncan's house and arrested him.

"Who are you?" he said, expecting no answer.

"My name is Rand. This is Mr. Deevers."

He eyed them in desperation. They were only a pair of crooked cops but the sight of them did things to him, not because they were staring at him as if he had eight legs, but because they were free to come or go, while he knew that all he had to do was make a quick move toward the open door before they shot him.

Deevers was as sallow as Rand was ruddy, as if all the color had been drained from his skin. He looked worn out. They both did. Why were they dressed like this? Where were their uniforms?

He folded his arms across his chest and stared at them. He would see himself in hell before he asked them why he had been arrested. Stoneface hadn't answered any of his questions and it was doubtful if these two would answer any either.

The one called Deevers gave his head an impatient jerk and Rand spoke again.

"We want to ask you one or two questions, then maybe we can answer some of yours." Rand smiled but it was an awkward motion and not genuine. He seemed stiff and uncomfortable.

The smile told Duncan something. If they were planning to kill him they didn't intend to get to it immediately.

"Go ahead and ask," he said.

"When did you first notice that your identity tag was gone?"

Duncan could feel his back sagging against the wall. Not the identification card again. He didn't want to hear about that anymore. It was too meaningless to consider it any further. Thinking about it made him feel sick and he suddenly felt a need for sleep, an overpowering urge to lie down and close his eyes.

"I don't know," he said.

"Try to remember, please."

"It wasn't a tag. It was an identification card. I was hunting through my wallet for something and the card dropped out. It fell into a gutter and washed down the drain."

Leaning forward in his chair, Rand said, "Where were you when this happened?"

"I had just left work and was on my way home."

"What city?" Deevers said quickly.

"Go to hell."

Deevers sat back and looked at Rand. "We're wasting time."

Duncan tasted the sweat on his upper lip. "If it's a case of identification I've more than enough evidence of who I am. There's my birth certificate."

They stared at him as if he had said something startling. Rand's expression quickly settled into blandness again but Deevers stopped looking surprised and began to scowl.

"Where is it?" said Rand.

"Stoneface has it. Your man outside."

Rand glanced at Deevers. "Go get it."

Still scowling, Deevers stood up. "I still say we ought to finish it right now." He received no response to his remark so he walked out of the room. A few moments later he came back with a slip of paper which he handed to Rand.

"Where do you suppose he found this?" said Rand after he had given the paper a quick look.

"There must be plenty of scraps around. This looks like part of a bill of—"

"He wouldn't know where to look. What would make him even think of looking?"

"How do you know what he was doing before he was brought in?" said Deevers. "He's been wandering all over the place."

Duncan gripped his knees tighter. Why did they talk as if he weren't sitting right here listening to them? The birth certificate meant no more to them than it had to Stoneface. That hadn't been a pleasant scene, the one with the guard.

"Just a minute," Duncan had said, offended but naturally sure of himself. "I may have lost my identification card but that doesn't mean I don't exist anymore. What kind of nonsense is this? I still have some rights."

And Stoneface had said, "What are rights?"

Yes, those had been the words. Duncan had yanked the birth certificate from his wallet and shoved it in the fool's face, convinced that if that didn't satisfy him nothing would. Well, he had been right about that.

After reading the data out loud Stoneface had said, "What is father? What is mother? What is birth?"

Duncan watched Rand. The man started to wad up the birth certificate, then he changed his mind and stuck it in his pocket. It was obvious that these two were mistaking him for someone else. Somebody had done something and Deevers and Rand thought he was the guilty person. If he didn't get off his lard in a hurry the situation might get too far out of hand, if it wasn't already.

"I didn't do it," he said. "You've got the wrong man."

"What did your identification card look like?" This was Rand speaking.

They can't keep this up, said the babbler in Duncan's mind. Sometime someone had to start making sense. He knew he was doing himself no good shuddering and jerking the way he was doing, but some demon in his mind kept warning that if he didn't let loose in some manner he would end the day as insane as these two.

"It was white, three by two inches, approximately," he said. "It carried my name, address, physical description and draft status."

"And it was white?"

"I said it was white."

Deevers was looking at him with quiet enmity. Why? There was no reason for this man to hate him. He'd never seen him before in his life.

Rand propped a boot on one knee and scraped dirt off the sole with a fingernail. "What did it look like after it fell out of your wallet?"

What did it look like? With a sense of doom he had watched the white card being swept away in the muddy torrent. It had disappeared into the drain along with leaves and mud. "What the hell?" He remembered himself saying that out loud. He had been surprised when he found himself kneeling by the gutter and he had been even more surprised to discover how badly he trembled. For a second he had thought the white card changed color and shape just before it fell into the drain. It had looked strangely metallic and spherical, green and utterly unfamiliar there in the wash.

"It looked green," he said and caught himself at once. "No, it was white. I told you, it was white."

Rand's fingers had halted on his boot and now he looked at Deevers with a little smile twisting his lips.

Deevers frowned and shook his head. "Doesn't mean a thing."

"You know it does."

Out loud Duncan had said to himself, "What the

hell?" and it made him feel real again. All he had done was drop his identity card out of his wallet. It could happen to anyone and often did. Of course he would get another one; or he could even make himself one. An identification card was a meaningless object, not an actual symbol at all. A piece of paper could never represent the sum total of a living, breathing human being.

"It doesn't make any difference what color it was," he said and looked at Deevers.

Rand replied. "It's very important."

"I can't see that it matters. If you want to find out who I am it should be easy to do."

"We already know who you are," said Deevers. He surely knew the effect that his words had upon Duncan, and his eyes showed that he did. They were small and round and dark and there was no laughter in them, but still he was amused and Duncan sensed it when he looked into them.

"Then why don't you let me out of here?" He had to say it twice because his voice was too hoarse the first time. "At least let me call my lawyer."

Rand looked away. "I'm afraid you can't call him."

"Why not?"

"Long distance rates," said Deevers and his dark eyes were more amused than ever.

Rand shot him an annoyed glance. "Cut it out."

"We're wasting time."

"You can't expect to solve this in an hour."

"I don't expect to solve it at all," said Deevers. "It's a measly point zero zero two percent. I say we mark him and the others like him off as an annual loss and forget it."

"No."

"We've gone through this routine a dozen times and we haven't learned a thing."

Duncan stared at them in bewilderment, then he

couldn't bear it any longer and he placed his hands flat on the floor and braced himself. Fear had robbed him of his strength. Slowly, laboriously, he began to stand up.

Deevers' face took on an expression of alarm. "Let's get out of here," he said.

"Wait—" cried Duncan and struggled to get his feet under him.

By the time he was erect both men were outside the room and the door was sliding shut. It halted a foot from the panel and Rand looked in at him.

"You mustn't do that again."

"Do what?" In fury and desperation Duncan shouted, "Let me out. You can't leave me here."

Through the crack he could see Deevers' eyes dance. The man got a kick out of him, especially when he became emotional.

"I haven't done anything. If you think I've committed a crime at least tell me what it is."

Shaking his head, Rand said, "You've committed no crime."

"All right, I'll behave, I won't fight you, I'm a worm and you're God Almighty but let me out of here."

"I can't."

"Tell me why."

"Because you're insane."

He recoiled from the pain of the words, slammed against the cell wall with a crash, hurt his head and his back. For a second he stared wildly about him, then he turned back to Rand.

"I don't believe you," he said and reached through the opening to grab Rand's shirt. Rand had already stepped backward. "This isn't a sanitarium. Where are the doctors and nurses? What is this place?"

"It's a storage room, the only place we have to put you in. Don't try to figure things out because you'll only hurt yourself."

Then they were both gone from the opening.

Duncan began to pace the floor and by the time he gave it up he was certain that he had worn a rut in it. He examined the walls of the cell. A smoother steel he had never placed his hands upon. It felt like glass and the rounded corners were as unscarred and slick as the rest.

Gradually his confidence returned. He hadn't been harmed and chances were that he wouldn't be. For some reason Rand and Deevers were trying to drive him out of his mind or make him doubt himself, and they had gone to a lot of trouble to make everything look right. But this was no jail cell. Stoneface's uniform had fooled him but now he knew it wasn't genuine and this meant that the police station out there was also phony. As for the cell, it must be just what Rand said it was, a storage room, but it was like none that Duncan had ever seen. A bulldozer would have had difficulty plowing its way through the thick door.

Finally he stretched out on the cold floor and laid his head on his arms. By God, something reasonable was bound to emerge from all this sooner or later and when it did he was going to raise a stink that would put Rand and Deevers behind bars where they belonged.

He was still on the floor when Rand came back. He didn't bother to get up since he could see that the other man had no intention of opening the door. Propping his chin on one hand he watched as Rand squinted through the narrow opening and finally located him.

"We have to talk some more."

"About the card, naturally," said Duncan.

Rand smiled faintly. "As a matter of fact, yes. It's very important, you know."

"All I know is that you look like a sane sort of person, not at all like a kidnapper. Who are you working for,

some espionage outfit? You're wasting your time. I haven't any secrets."

Sighing, Rand leaned against the panel. "Concentrate on the tag. I mean the card. How did you feel when you saw it lying in the gutter?"

"I can't remember."

"Try."

"I didn't feel anything. Why should I?"

"I think you're lying."

Duncan raised his head. "Do me a favor and go away."

"Believe me, this is important."

"Believe you? That's good."

"Did you feel angry?" said Rand.

"No."

"Sad?"

"Of course not."

"Happy?"

"Go away."

"Did you feel a sense of doom?"

Duncan clutched his head and writhed onto his back. "Nan!" he yelled.

Rand's surprised face poked through the opening. "Who's Nan?"

"My wife, you fool."

"Your wife?"

His loving wife. She had said, "What happened? Were you in an accident? Did you fall?

He had just stepped into the house—tired, hungry and beginning to get angry because there was no food on the table. She kept nagging at him, questioning him, until he lost his temper and swore at her. That made him contrite and he tried to kiss her. She held him off while she stared at his chest with a horrified expression on her face. Then she marched to the phone and called the police.

"She's ill," he said to Rand. "Don't you see why I have

to get out of here? You can help me. All you have to do is open the door wide enough for me to get through."

It wasn't working. Rand only stood and stared at him, and it wasn't working. He was telling the truth but it didn't matter. "When are you going to stop this?" he said angrily.

"I can't stop," said Rand.

Very well. Enough was enough. There was no one to help him but himself.

"At least bring me a cot to lie down on," he said. "How would you like to sleep on this floor?"

"I'm sorry about that," Rand said. "I forgot that it might be uncomfortable."

"Well?"

"I'll send a cot in with N—with Stoneface."

As Rand's face disappeared from the opening Duncan smiled and stole to his feet. He had to get out one way or another and if they insisted that he play the game their way, then play it he would.

He was in the corner beside the door when Stoneface opened it and carried in a cot. The guard had no warning at all. He was in the act of setting down the bed when Duncan's bunched fists crashed against the back of his neck.

The differences became apparent as soon as he stepped out of the cell. Someone had taken away the police station. Now he was in a very small enclosure, all of it made of shiny steel, with a small door beside his prison and another one ten feet away.

Before his dread could begin to build he swiftly cut it off. It was all right. Let them switch things around. They were playing more games but this wasn't going to stop him for a second.

He pressed on the door beside the cell and it slid back a fraction of an inch. Holding his breath he stiffened to immobility as he overheard Rand and Deevers talking.

"Conscience is a function of intelligence," Rand was saying, and he sounded angry. "Where's yours? You're always talking about your IQ."

"I don't believe in wasting it," said Deevers.

"We're responsible. We did it to him, you and I."

"So we did it. You have enough business sense that I don't have to tell you what to do. You're stalling."

"Damn you, he'll go into the Atomizer soon enough."

Duncan pressed on the door and it slid back. After he was inside the room he shut the door and then stepped behind a row of tall cartons. He still couldn't see the two men so he quietly moved toward the sound of their voices.

"It happened because he lost his identity tag," said Rand. He spoke doggedly, as if he were repeating something he had said many times.

"That's screwy."

"It's the growth unit that's screwy."

Deevers' tone became frigid. "Now what are you suggesting?"

"Don't worry, we can stop this without your losing money. I wouldn't want you to come out a dollar short. Nothing like that."

"What makes you think you have it all figured out?"

"When he lost his identity tag he went into a state of shock," said Rand. "Suddenly he was nobody. He couldn't stand it and he immediately fell back on his subconscious. Damn it, don't sneer. It's obvious that he has one. Where else does he get his memories? Don't you see? He couldn't stand being a nonentity. He had to have a self."

What Deevers saw had nothing to do with what Rand was saying. His eyes widened and his face went pale as he spied Duncan standing behind the cartons. One hand made a jerky motion and his coffee cup overturned and crashed to the floor.

A sudden stiffening of Rand's back was the only sign that the smaller man, too, was aware that something was wrong.

"I'm younger and bigger than both of you and I'm desperate," said Duncan. "Don't do anything stupid."

"Don't come any closer," said Deevers. His hands came up in front of his face and he seemed to shrink in his chair. "Where's the guard?" he said around his hands.

"I knocked him out. Don't worry. I didn't hurt him."

"Oh, my God," Deevers breathed and his eyes darted to Rand. "You and your damned psychology."

Slowly Rand turned. His face was pale but he appeared to be calm. "He isn't dangerous."

Duncan stepped from behind the cartons and came toward them. As he moved he looked around him. They had been drinking coffee. The table was littered with cigarette stubs. Two bunks hugged a wall and an old oil-burner warmed a coffeepot. The cartons and boxes that flanked the walls bore food labels. An open closet revealed several articles of clothing—coats, hoods, boots—and a pair of weird outfits that looked like rubber diving suits hung from a hook.

He saw no weapons until he turned and saw the gun Deevers was pointing at him.

Rand saw it at the same time and he spun toward Deevers and snapped, "Put that away."

The gun wavered in Deevers' grasp. "What's he going to do?"

Duncan's hands clenched into fists. "You have no right to shoot me. I haven't done anything. I'm innocent."

"He's right," said Rand. "Put it down."

Deevers hesitated in indecision. Suddenly he tossed the gun to the floor and watched it skid to rest at Duncan's feet.

"Go on," he said. "Pick it up. You're the boss here."

"I don't want the gun. I only want to leave."

"There isn't anyplace to go," Rand said in a strange voice.

"I want to go home."

"This isn't—"

"Shut up and let him go," Deevers ground out through clenched teeth.

"Can't you get it through your thick head that he's suffering?"

"Go on," Deevers said to Duncan with a tight grin. "You're free. Don't listen to him. He's crazier than you are."

On stiff legs Duncan started toward the door. He was nearly there when Rand called to him.

"When you go out make sure you close all the doors after you. And when you come back be sure to do the same."

"I'm not coming back."

Rand sat on the edge of his chair with his head drooping between his knees and he didn't look up as he replied. "You will. The delusion began breaking up the moment you said that tag was green. Remember what I'm saying. Our lives depend on it." Clasping his hands and touching them to his forehead, Rand said, "Don't blame us too much. We didn't mean to do it."

Duncan stood still with his hand outstretched toward the door while a chill ran through him. The man had sounded so earnest, yet his words were meaningless. What was he trying to do? Was this another trick to keep him here until they finished whatever it was they had begun? To hell with Rand, and Deevers too. He needn't stay here and listen, they couldn't keep him because they were weak, he had been their prisoner and they hadn't the nerve to use the gun on him. He was free, wasn't he?

He had never known freedom to be so exhilarating. He raced toward the outside world as though he had

been gone from it for an eternity and his feet made clicking sounds on the steel floor as he sped through doors and hurriedly closed them after him. There was a long tunnel divided into three short compartments which contained crates and pieces of machinery, but he didn't give them a second glance.

At last he was out from that shell of a grave. Light hit his face, a gasp burst from his throat, automatically his hand closed the final door, then he whirled and made ready to greet the world. Again he gasped. He must have made a wrong turn somewhere in the tunnel, that surely had to be the explanation for what stretched about him in every direction, he had simply missed a turn and gone the wrong way, for this wasn't—

It was all right when they came into his home and dragged him away, and it was all right when they threw him into a dark hole and left him to suffer. It was even all right when they took away the police station and put steel caverns in its place, but, please God, this wasn't all right. They couldn't take away the world from under his feet.

The sky was a white flame dominated by a sun that lashed the ground with a solid sheet of light. Clouds bunched everywhere, yet the vast sky was a blinding mirror. The ground beneath him was a barren waste. No soil lay there, only a pitted plane of dust that rose to choke him as he stumbled forward in fear. Jagged spears of rock rose all around him, some as tall as buildings, others so small he could step over them. Heat waves made the space in front of him dance.

Something moved in the distance, tiny specks were outlined against the ugly horizon, and he went that way while his heart slammed against his ribs. As he walked he prayed that it was Earth around him, some unexplored desert where the laws of nature followed their own patterns, but he knew this place had nothing

to do with his homeland. It was the wrecked surface of another world, some other planet in the cosmos, which meant that reality had abandoned him because man didn't even know how to reach the moon.

Now he saw figures moving ahead of him and he quickened his pace. Hope reared and battled his fear that he was alone on an alien planet with two madmen.

A great valley had been slashed out of the planet's body and in its depths lay a vast mechanical complex. The valley's long slope was terraced with shelves that formed a stairway descending into a pit. Shovels scooped up tons of rock and dumped them into open cars that rolled on tracks out of a shallow lip of the valley. The tracks dipped across a clear area where they disappeared into the rocks.

Crews worked at the mouth of a deep shaft, guided a pulley that drew buckets from the shaft and carried them to a domed building at the valley's edge. Above the valley other crews worked with sluices that filtered samples of rock into a funnel-shaped container. These were the figures Duncan had spied from the distance and as he ran toward them he started to call a greeting. He was no more than twenty feet away from the nearest one when he stopped running and stood staring in disbelief at the man who wasn't a man at all.

None of the figures was human. They were insects—large antlike creatures that moved much faster than humans and possessed the strength to lift and manipulate buckets that must have held a quarter-ton of ore.

They worked with silent precision and as Duncan took a faltering step toward them they turned to give him a glance, then they went on with their work. Their bodies were a shiny brown series of hairy bubbles, tier upon tier that formed two legs, a torso, two arms with three flexible digits for hands and a knobby head. They had two bulging eyes that glistened like dark liquid. A small

hole the size of a quarter was situated beneath the eyes.

He didn't see a single human being. The crews in the valley, the workers above it, the occasional laborers who moved in and out of the domed structure were ants, every one.

For long minutes Duncan let this fact be absorbed by his brain. New fear stole into his mind like fog prowling through forbidden corners, a nameless dread that soaked into him like cold water.

He started toward two creatures who were watching a stream of dirty water gush down a sluice. His fear made him clumsy and he didn't see the mound of ore until he had fallen over it. He lay on his back and stared up into the face of one of the insects. It was bending over him.

"You have fallen," it said in a soft monotone. "I will help you stand and we will then give you a careful check for damage."

The hands that took him and put him on his feet were hard and powerful. A green circular plate was imbedded in the middle of the ant's thick chest. Stamped upon it were the letters, ABT. The bulging eyes looked down at Duncan's legs, then traveled slowly upward to rivet on his chest.

"Your identity tag is gone," said the thing.

Tearing free of the creature's grasp, Duncan began to back away. "You're an insect," he whispered. "You don't know anything." All at once he was shouting. "You're a stupid animal and you don't know anything."

"Are you really there?" said the ant.

"A stupid, brainless collection of instincts," Duncan cried. He kept backing away and he slipped and slid on the rocky ground. The ant took a step after him and he yelled, "Get away from me."

"You have no identity," said the creature. "There is

no such thing as a selfless being. Something is wrong. A man must be notified."

"I'm a man," whimpered Duncan.

"You are nothing. I try to comprehend but I cannot. Why do you appear to be standing there?"

Suddenly a second ant stepped between the two of them. Its eyes surveyed ABT and then moved to the right and focused on Duncan. The plate on its chest bore the letters, NN.

One of its fingers came up and pointed at Duncan's chest. "This is a lost one. Let him alone. Do not look at him. Do not think of him. He is lost. He will be acknowledged by man only for only man can conceive of abstracts."

ABT gave a slow nod. "Now I comprehend. You are right. He is lost. He is not there for you or me, but he is there for man."

Duncan stumbled away and hid behind a thin stalk of rock. The two ants stared after him for a few moments, then they went back to the sluice as if they had forgotten him.

He collapsed onto his back. There was nothing in the sky but the white glare that seemed to be everywhere. It even reached into his brain. Unbidden, the knowledge came to him. The sun looked like this because the atmosphere was different than that of Earth's.

His chest moved up and down as he drew in lungfuls of fresh air. No. That was part of the dream and not reality. He was the dream. Everything was reality but himself.

He wanted to believe it, desperately wanted it to be so, but almost at once he gave up this lie. He was real and so was the planet on which he lay, and these two facts added together meant that either he was capable of breathing where there was no oxygen to breathe or

he was consuming substances that were poisonous to human beings.

But he was on Earth. He was an Earthman and he owned a white house and he had a wife named Nan. She had brown hair and dark eyes. The children would resemble her when they were born. Or had they already been born? The sun burned his brain so that he couldn't remember. He lowered his head to the sterile ground and closed his eyes.

It took him a long time to retrace his steps back into the tunnel. He stumbled as if blind, crashed headlong into scarred dunes, fell into gullies and painfully hauled himself out.

He closed all the doors behind him.

Rand and Deevers had carried Stoneface from the cell and laid him in a corner of their living quarters. Duncan stopped and stood looking down at what he had believed was a human being. He had thought he was knocking out a man. What he had done was destroy a giant ant. His fists had crushed the spindly neck and nearly severed the head. A tangle of bloody loops and glistening white tissue bulged from the wound. The green chest tag with the letters NN lay on the floor like an eye that mocked him.

Deevers had whirled as he came in and hurriedly moved to the far side of the table. Now he sat down, his eyes hard and wary.

Rand was standing in the middle of the room with his hands behind his back. He stared intently at the floor as though he had no desire to look at anything else.

With slow steps Duncan moved until he stood directly in front of Rand. He tried to keep his gaze steady but as Rand's head came up he found his own drooping until his chin touched his chest. He felt sweat forming on his back and his mind cringed as he waited for the words that would condemn him to an insane nonentity.

He still wasn't prepared for them when they came. They were whips that lashed his body with steel tips. They drove him into a black cave where he cowered in terror. He didn't look at Rand, but he sought for the lie in the man's tone, listened for the subtle slyness that would prove this thing a hoax, a fraud, an attempt to destroy his reality for some obscure purpose.

There was no mockery in Rand's voice or any other evidence of fraud. He spoke evenly and without emotion, frankly and cruelly, and only the pinched lines around his eyes betrayed his awareness of the pain he was causing.

"Deevers and I hold controlling interests in a company on Earth called the DNA Laboratory. We make living organisms to labor on planets hostile to men. Our major production concerns a large insectlike creature whose job it is to mine metals which are unavailable on Earth.

"The elements in all organisms are the same; only the proportions vary. An organism grows if new matter accumulates faster than the old matter breaks down. Maturity is reached when matter-building takes place at the same rate as the old matter disintegrates. What we do is hold off this last process until our products arrive at a satisfactory size.

"Our 'insects' come in three classifications, three types conditioned and trained for three specific jobs. The DKN and ABT types operate the sluices and mine the pits. Our two NN types are programmed to monitor the others to see that nothing goes wrong. Two years ago one of the ABT's went insane. He thought he was a man. Deevers and I spent two years trying to find out what made him and several other insects psychotic. Now we know, thanks to you.

"Our creatures are grown from a portion of life-material and the development is manipulated so that

the nervous system and muscular units will be compatible with the brain which is constructed separately. As the insect grows it is chemically conditioned to survive in various types of environments. The carbohydrates, fats and proteins constituting the brain are designed in such a way that they reproduce a human brain, not just a reasonable facsimile but an exact duplication of the brain of a man who once lived. Who the man was whose brain we used as a model doesn't matter. What does matter is that we've created something we don't understand.

"Deevers and I wanted time to test our new products before they were brought here but the government needed metal and pressured us into giving up that part of our program. We consented because we had no reason to suspect our insects knew anything other than what they had been taught. The strange thing is, we're almost certain those creatures working out there *don't* know anything else.

"But you do and the others like you did. A few hours ago you lost your identity tag. Maybe it was snagged by one of the pulley hooks that draw buckets to the sluices. However it was lost, you found yourself without an identity. Your brain rejected the concept of nonentity and fashioned you a new self. We don't know how or why this happened. We don't know how you could acquire memories of Earth and human life and culture when nobody taught them to you, but we know that you have.

"I'd like to stop this whole business right now. I want time to study my products, throw every psychological test in the book at them and find out just what it is I've made. Have I made a creature satisfied to do its work as I intended or is it an alien monstrosity condemned to misery? But they won't give me the time. The government says no. The insects will be used to produce what

Earth needs. So there's only one thing I can do, and I hope it's the right thing and not just an interference that will make the situation worse. From now on the workers will be made without any real identity. They won't be trained to self-awareness in the sense that there's any significance attached to it. Their letter types will be attached under the loop between their thorax and pelvis, and they'll know nothing about it. I hope it works. I hope that if they have no identities, if they aren't taught that there is such a thing as self, they won't be able to lose them.

"That's all I can do. I can't think of anything else at this time."

Rand stopped speaking. He raised his hands and ran his fingers savagely through his hair. His shoulders slumped and he closed his eyes.

Duncan lifted one of his own hands and stared at it. He could see the creases in the palm, the dark hair above the knuckles on the back. He felt his heart pumping blood through his body. The dream—if the unreality into which his mind had plunged could be called a dream—wouldn't go away.

Finally he raised his head. "What happened to the others?"

"They wanted to die."

A voice whispered, "And so do I," and Duncan realized it was his own.

"We have an Atomizer in the domed building by the valley," said Rand. "We use it to destroy the residue of rock collected from the last stages of our mining."

Residue of rock? To die as such would mean that he hadn't lived at all, and he had lived. For the past few hours he had been real. His death ought to have reason in it. But what reason was there for him?

He searched his memories and fastened upon one. Men once were put to death for crimes, and he was

guilty of the crime of deception. He had pretended that he was human. This was a lie. His birth had been an assembly-line production, and his conception was accomplished within a piece of laboratory equipment. He had claimed that Earth was his home. This, too, had been a lie. He had no home. The word meant a place of growth, warmth and compassion, not an alien island called Venus where nothing grew but time, where warmth was measured in the holocaust of blast furnaces and where compassion was a cancerous spread in piece of CNA.

He was guilty. His sentence was death.

"I'm ready," he said.

"I want to go with you," said Rand, and when Duncan hesitated he continued. "I know you're still in the dream. You can't go alone."

Duncan tried to speak, but all he could do was nod.

Rand took one of the rubbery suits from the wall hook and began to put it on.

Deevers still sat at the table. He was relaxed now as he watched a trail of cigarette smoke climb toward the ceiling. As Duncan started toward him his head jerked around and his eyes narrowed.

"You and I have something in common," said Duncan. "We're both lacking in humanness."

Deevers' mouth tightened and his face darkened. He started to say something, then suddenly turned his head away.

Rand led the way out to the second compartment where he wheeled a small open car into the corridor. He and Duncan stepped into it. Behind the wheel, Rand moved the car down the corridor until the last door slid shut behind them.

Out in the open the car plowed across gullies and between rocks and carried the two toward the valley where the domed building sat. The sun was merciless.

To Duncan it was a soft yellow orb that made him blink his eyes. The ground was rough and porous but Duncan imagined that he saw grass swaying in the wind. He watched a rabbit dart from its burrow and sniff at the air for a moment before it lunged into a thicket.

Rand took him into the building past the fiery furnaces that he didn't remember, along a twisting corridor that led into a blindingly hot room where yellow gold leaped down a sluice and splattered into molds that rolled away on the tracks.

The Atomizer was taller than a man and twice as wide. It was a box of metal with a transparent door. When Duncan looked into it he saw the air within shimmer as desert air shimmered beneath the sun.

Rand had him by the arm. "Can you hear me?" His face was pale behind the visor and his hand trembled on Duncan's arm. "You only have to step inside and close the door."

Duncan took a step toward the box.

Rand held him fast. "Let the dream fade. What good has it done you? You can't go like this."

Duncan knew that if he were a man on Earth condemned to die, it could happen the same way. A priest would come and give him the last rites, then a medic would appear to offer him an anesthetic; a little something to take away the terror. This was allowed by law. Killing a man was enough and there was no need to hurt him in the process.

But that wasn't the kind of death he wanted.

As he stepped through the door he was looking at a tiny splash light that might have been made by the sun.

He closed the door with his own hand.

He saw Rand's lips forming the soundless words, "Good bye, DKN."

The dream sheltered him, reared between him and the specter of an insect self. In his mind he cried, I am a

man, and his reality was victorious over the other reality. The destructive forces that streamed through the atoms of his leathery body penetrated the sensitive softness of a human being, and his journey into oblivion was painful and terrible. As he desired.

A BRACE OF ELLISON

The trouble with sounded plays on words is that they don't look like much on paper: the above should be read as both "A Brace of Ellison" and "Abrasive Ellison," because that's what I mean to say. There are writers who cajole and persuade you, there are writers who charm you, there are writers who inspire you. Ellison is a writer who rubs up against you with such violence and energy that he leaves you raw and vulnerable.

Ellison was a man born to success. He was working toward it with persistence and skill before he was out of high school; he was never stopped. If you were to write Harlan Ellison's life story in the form of a novel, he would sould a lot like Sammy Glick: he never stops running, he never stops pushing. Whatever it is that the world has to offer as a reward, he cannot wait.

But that is a terrible injustice, for what Harlan Allison also has is a talent for so saturating you with the violence and color and excitement of what he is saying that his stories are each one a life experience. There are qualities Ellison lacks as a writer. But so great is his force, so impassionedly exact are his words, that you'll seldom notice anything is missing at all: and sometimes there is nothing missing, as in these two.

AT THE MOUSE CIRCUS
by Harlan Ellison

The King of Tibet was having himself a fat white woman. He had thrown himself down a jelly tunnel, millennia before, and periodically, as he pumped her, a soft pink-and-white bunny rabbit in weskit and spats trembled through, scrutinizing a turnip watch at the end of a heavy gold-link chain. The white woman was soft as suet, with little black eyes thrust deep under prominent brown ridges. Honkie bitch groaned in unfulfilled ecstasy, trying desperately and knowing she never would. For she never had. The King of Tibet had a bellyache. Oh, to be in another place, doing another thing, alone.

The land outside was shimmering in waves of fear that came radiating from mountaintops far away. On the mountaintops, grizzled and wizened old men considered ways and means, considered runes and portents, considered whys and wherefores . . . ignored them all . . . and set about sending more fear to farther places. The land rippled in the night, beginning to quake with terror that was greater than the fear that had gone before.

"What time is it?" he asked, and received no answer.

Thirty-seven years ago, when the King of Tibet had been a lad, there had been a man with one leg—who had been his father for a short time—and a woman with a touch of the tar brush in her, and she had served as mother.

"You can be anything, Charles," she had said to him. "Anything you want to be. A man can be anything he can do. Uncle Wiggly, Jomo Fenyatta, the King of Tibet, if you want to. Light enough or black, Charles, it

don't mean a thing. You just go your way and be good and *do*. That's all you got to remember."

The King of Tibet had fallen on hard times. Fat white women and cheap cologne. Doodad, he had lost the horizon. Exquisite, he had dealt with surfaces and been dealt with similarly. Wasted, he had done time.

"I got to go," he told her.

"Not yet, just a little more. Please."

So he stayed. Banners unfurled, lying limp in absence of breezes from Camelot, he stayed and suffered. Finally, she turned him loose, and the King of Tibet stood in the shower for forty minutes. Golden skin pelted, drinking, he was never quite clean. Scented, abluted, he still knew the odors of wombats, hallway musk, granaries, futile beakers of noxious fluids. If he was a white mouse, why could he not see his treadmill?

"Listen, baby, I got need of fi'hunnerd dollahs. I know we ain't been together but a while, but I got this *bad* need." She went to snap-purses and returned.

He hated her more for doing than not doing.

And in her past, he knew he was no part of any recognizable future.

"Charlie, when'll I see you again?" Stranger, never!

Borne away in the silver flesh of Cadillac, the great beautiful mother Hog, plunging wheelbased at one hundred and twenty (bought with his semen) inches, Eldorado god-creature of four hundred horsepower, displacing recklessly 440 cubic inches, thundering into forgetting weighing 4550+ pounds, goes . . . went . . . Charlie . . . Charles . . . the King of Tibet. Golden brown, cleaned as best as he could, five hundred reasons and five hundred aways. Driven, driving into the outside.

Forever inside, the King of Tibet, going outside.

Along the road. Manhattan, Jersey City, New Brunswick, Trenton. In Norristown, having had lunch at a fine restaurant, Charlie was stopped on a street corner by a voice that went pssst from a mailbox. He opened the slit and a small boy in a pullover sweater and tie thrust his head and shoulders into the night. "You've got to help me," the boy said. "My name is Batson. Billy Batson. I work for radio station WHIZ and if I could only remember the right word, and if I could only *say* it, something wonderful would happen. S is for the wisdom of Solomon, H is for the strength of Hercules, A is for the stamina of Atlas, Z is for the power of Zeus . . . and after that I go blank. . . ."

The King of Tibet slowly and steadily thrust the head back into the mailslot, and walked away. Reading, Harrisburg, Mt. Union, Altoona, Nanty Glo.

On the road to Pittsburgh there was a four-fingered mouse in red shorts with two big yellow buttons on the front, hitch-hiking. Shoes like two big boxing gloves, bright eyes sincere, forlorn and way lost, he stood on the curb with meaty thumb and he waited. Charlie whizzed past. It was not his dream.

Youngstown, Akron, Canton, Columbus, and hungry once more in Dayton.

O.

Oh aitch eye oh. Why did he ever leave. He had never been there before. This was the good place. The river flowed dark and the day passed overhead like some other river. He pulled into a parking space and did not even lock the god-mother Eldorado. It waited patiently, knowing its upholstered belly would be filled with the King of Tibet soon enough.

"Feed you next," he told the sentient vehicle, as he walked away toward the restaurant.

Inside—dim and candled at high noon—he was shown to a heavy wood booth, and there he had laid be-

fore him a pure white linen napkin, five pieces of silver, a crystal goblet in which fine water waited, and a promise. From the promise he selected nine-to-five winners, a long shot and the play number for the day.

A flocked velvet witch perched on a bar stool across from him turned, exposed thigh and smiled. He offered her silver, water, a promise, and they struck a bargain.

Charlie stared into her oiled teakwood eyes through the candle flame between them. All moistened saran wrap was her skin. All thistled gleaming were her teeth. All mystery of cupped hollows beneath cheekbones was she. Charlie had bought a television set once, because the redhead in the commercial was part of his dream. He had bought an electric toothbrush because the brunette with her capped teeth had indicated she, too, was part of his dream. And his great Eldorado, of course. *That* was the dream of the King of Tibet.

"What time is it?" But he received no answer and, drying his lips of the last of the *pêche flambée,* he and the flocked velvet witch left the restaurant: he with his dream fraying, and she with no product save one to sell.

There was a party in a house on a hill.

When they drove up the asphalt drive, the blacktop beneath them uncoiled like the sooty tongue of a great primitive snake. "You'll like these people," she said, and took the sensitive face of the King of Tibet between her hands and kissed him deeply. Her fingernails were gunmetal silvered and her palms were faintly moist and plump, with expectations of tactile enrichments.

They walked up to the house. Lit from within, every window held a color facet of light. Sounds swelled as they came toward the house. He fell a step behind her and watched the way her skin flowed. She reached out, touched the house, and they became one.

No door was opened to them, but holding fast to

her hair he was drawn behind her, through the flesh of the house.

Within, there were inlaid ivory boxes that, when opened, revealed smaller boxes within. He became fascinated by one such box, sitting high on a pedestal in the center of an om rug. The box was inlaid with teeth of otters and puff adders and lynx. He opened the first box and within was a second box frosted with rime. Within the frost-box was a third, and it was decorated with mirrors that cast back no reflections. And next within was a box whose surface was a mass of intaglios, and they were all fingerprints, and none of Charlie's fit, and only when a passing man smiled and caressed the lid did it open, revealing the next, smaller box. And so it went, till he lost count of the boxes and the journey ended when he could not see the box that fit within the dust-mote size box that was within all the others. But he knew there were more, and he felt a great sadness that he could not get to them.

"What is it, precisely, you want?" asked an older woman with very good bones. He was leaning against a wall whose only ornamentation was a gigantic wooden crucifix on which a Christ figure hung, head bowed, shoulders twisted as only shoulders can be whose arms have been pulled from sockets; the figure was made of massive pieces of wood, all artfully stained: chunks of doors, bedposts, rowels, splines, pintles, joists, crossties, rabbet-joined bits of massive frames.

"I want . . ." he began, then spread his hands in confusion. He knew what he wanted to say, but no one had ever ordered the progression of words properly.

"Is it Madelaine?" the older woman asked. She smiled as Aunt Jemima would smile, and targeted a finger across the enormous living room, bulls-eyed on the flocked velvet witch all the way over there by the fireplace. "She's here."

The King of Tibet felt a bit more relaxed.

"Now," the older woman said, her hand on Charlie's cheek, "what is it you need to know? Tell me. We have all the answers here. Truly."

"I want to know—"

The television screen went silver and cast a pool of light, drawing Charlie's attention. The possibilities were listed on the screen. And what he had wanted to know seemed inconsequential compared to the choices he saw listed.

"That one," he said. "That second one. How did the dinosaurs die."

"Oh, fine!" She looked pleased he had selected that one. "Shefti . . . ?" she called to a tall man with gray hair at the temples. He looked up from speaking to several women and another man, looked up expectantly, and she said, "He's picked the second one. May I?"

"Of course, darling," Shefti said, raising his wine glass to her.

"Do we have time?"

"Oh, I think so," he said.

"Yes . . . what time *is* it?" Charlie asked.

"Over here," the older woman said, leading him firmly by the forearm. They stopped beside another wall. Look."

The King of Tibet stared at the wall, and it paled, turned to ice, and became translucent. There was something imbedded in the ice. Something huge. Something dark. He stared harder, his eyes straining to make out the shape. Then he was seeing more clearly and it was a great saurian, frozen at the moment of pouncing on some lesser species.

"*Gorgosaurus*," the older woman said at his elbow. "It rather resembles *Tyrannosaurus*, you see; but the forelimbs have only two digits. You see?"

Thirty-two feet of tanned gray leather. The killing

teeth. The nostriled snout, the amber smoke eyes of the eater of carrion. The smooth sickening tuber of balancing tail, the crippled forelimbs carried tragically, withered and useless. The musculature . . . the pulsing heat of iced blood beneath the tarpaulin hide. The . . . beat . . . .

It lived.

Through the ice went the King of Tibet, accompanied by Circe-eyed older woman, as the shellfish-white living room receded back beyond the ice-wall. Ice went, night came.

Ice that melted slowly from the great hulk before him. He stood in wonder. "See," the woman said.

And he saw as the ice dissolved into mist and night-fog, and he saw as the earth trembled, and he saw as the great fury lizard moved in shambling hesitancy, and he saw as the others came to cluster unseen nearby. *Scolosarus* came. *Trachodon* came. *Stephanosaurus* came. *Protoceratops* came. And all stood, waiting.

The King of Tibet knew there were slaughterhouses where the beef was hung upside-down on hooks, where the throats were slit and the blood ran thick as motor oil. He saw a golden thing hanging, and would not look. Later, he would look.

They waited. Silently, for its coming.

Through the Cretaceous swamp it *was* coming. Charlie could hear it. Not loud, but coming steadily closer. "Would you light my cigarette, please," asked the older woman.

It was shining. It bore a pale white nimbus. It was stepping through the swamp, black to its thighs from the decaying matter. It came on, its eyes set back under furred brow-ridges, jaw thrust forward, wide nostrils sniffing at the chill night, arms covered with matted filth and hair. Savior man.

He came to the lizard owners of the land. He walked

around them and they stood silently, their time at hand. Then he touched them, one after the other, and the plague took them. Blue fungus spread from the five-pronged marks left on their imperishable hides: blue death radiating from impressions of opposed thumbs, joining, spreading cilia and rotting the flesh of the great gone dinosaurs.

The ice reformed and the King of Tibet moved back through pearly cold to the living room.

He struck a match and lit her cigarette.

She thanked him and walked away.

The flocked velvet witch returned. "Did you have a nice time?" He thought of the boxes-within-boxes.

"Is that how they died? Was he the first?"

She nodded. "And did Nita ask you for anything?"

Charlie had never seen the sea. Oh, there had been the Narrows and the East River and the Hudson, but he had never seen the sea. The real sea, the thunder sea that went black at night like a pane of glass. The sea that could summon and the sea that could kill, that could swallow whole cities and turn them into myth. He wanted to go to California.

He suddenly felt a fear he would never leave this thing called Ohio here.

"I asked you: did Nita ask you for anything?"

He shivered.

"What?"

"Nita. Did she ask you for anything?"

"Only a light."

"Did you give it to her?"

"Yes."

Madelaine's face swam in the thin fluid of his sight. Her jaw muscles trembled. She turned and walked across the room. Everyone turned to look at her. She went to Nita, who suddenly took a step backward and threw up her hands. "No, I didn't—"

The flocked velvet witch darted a hand toward the older woman and the hand seemed to pass into her neck. The silver-tipped fingers reappeared, clenched around a fine sparkling filament. Then Madelaine snapped it off with a grunt.

There was a terrible minor sound from Nita, then she turned, watery, and stood silently beside the window, looking empty and hopeless.

Madelaine wiped her hand on the back of the sofa and came to Charlie. "We'll go now. The party is over."

He drove in silence back to town.

"Are you coming up?" he asked, when they parked the Eldorado in front of the hotel.

"I'm coming up."

He registered them as Prof. Pierre and Marja Sklodowska Curie and for the first time in his life he was unable to reach a climax. He fell asleep sobbing over never having seen the sea, and came awake hours later with the night still pressing against the walls. She was not there.

He heard sounds from the street, and went to the window.

There was a large crowd in the street, gathered around his car.

As he watched, a man went to his knees before the golden Eldorado and touched it. Charlie knew *this* was his dream. He could not move; he just watched; as they ate his car.

The man put his mouth to the hood and it came away bloody. A great chunk had been ripped from the gleaming hide of the Cadillac. Golden blood ran down the man's jaws.

Another man draped himself over the top of the car and even through the window the King of Tibet could hear the terrible sucking, slobbering sounds. Furrows were ripped in the top.

A woman pulled her dress up around her hips and backed, on all fours, to the rear of the car. Her face trembled with soft expectancy, and then it was inside her and she moved on it.

When she came, they all moved in on the car and he watched as his dream went inside them, piece by piece, chewed and eaten as he stood by helpless.

"That's all, Charlie," he heard her say, behind him. He could not turn to look at her, but her reflection was superimposed over his own in the window. Out there in darkness now, they moved away, having eaten.

He looked, and saw the golden thing hanging upside-down in the slaughterhouse, its throat cut, its blood drained away in onyx gutters.

Afoot, in Dayton, Ohio, he was dead of dreams.

"What time is it?" he asked.

SILENT IN GEHENNA

by Harlan Ellison

Joe Bob Hickey had no astrological sign. Or rather more precisely, he had twelve. Every year he celebrated his birthday under a different Pisces, Gemini or Scorpio. Joe Bob Hickey was an orphan. He was also a bastard. He had been found on the front porch of the Sedgwick County, Kansas Foundling Home. Wrapped in a stained army blanket, he had been deserted on one of the Home's porch gliders. That was in 1992.

Years later, the matron who discovered him on the porch remarked, looking into his eyes was like staring down a hall with empty mirrors.

Joe Bob was an unruly child. In the Home he seemed to seek out trouble, in no matter what dark closet it hid, and sink his teeth into it; nor would he turn it loose, bloody and spent, till thunder crashed. Shunted from foster home to foster home, he finally took off at

the age of thirteen, snarling. That was in 2005. Nobody even offered to pack him peanut butter sandwiches. But after a while he was fourteen, then sixteen, then eighteen, and by that time he had discovered what the world was really all about, he had built muscle, he had read books and tasted the rain, and on some road he had found his purpose in life, and that was all right, so he didn't have to worry about going back. And *fuck* their peanut butter sandwiches.

Joe Bob attached the jumper cable, making certain it was circled out far enough behind and around him to permit him sufficient crawl-space without snagging the bull. He pulled the heavy-wire snippers from his rucksack, but the fence in the shape or a church window, returned the snips to the rucksack, slung it over one shoulder and shrugged into it—once again reminding himself to figure out a new system of harness so the bullhorn and the rucksack didn't tangle.

Then, down on his gut; he pulled himself on elbows tight to his sides, through the electrified fence, onto the grounds of the University of Southern California. The lights from the guard towers never quite connected at this far corner of the quad. An overlooked blind spot. But he could see the State Trooper in his tower, to the left, tracking the area with the mini-radar unit. Joe Bob grinned. His bollixer was feeding back pussycat shape.

Digging his hands into the ground, frogging his legs, flatworm fellow, he did an Australian Crawl through the no-man's land of the blind spot. Once, the Trooper held in his direction, but the mini-radar picked up only feline and as curiosity paled and vanished, he moved on. Joe Bob slicked along smoothly. (Lignum vitae, owing to the diagonal and oblique arrangement of the successive layers of its fibres, cannot be split. Not only is it an incredibly tough wood—with a specific gravity

of 1.333 it sinks in water—but, containing in its pores 26% of resin, it is lustrous and self-oiling. For this reason, it was used as bearings in the engines of early ocean-going steamships.) Joe Bob as lignum vitae. Slicking along oilily through the dark.

The Earth Sciences building—Esso Hall, intaglio'd on a lintel—loomed up out of the light fog that wisped through the quadrangle, close to the ground. Joe Bob worked toward it, idly sucking at a cavity in a molar where a bit of stolen/fried/enjoyed chicken meat had lodged. There were trip-springs irregularly spaced around the building. Belly down, he did an elaborate flat-out slalom through them, performing a delicate calligraphy of passage. Then he was at the building, and he sat up, back to the wall, and unvelcre-ing, the flap of a bandolier pocket.

Plastique.

Outdated, in these times of sonic explosives and mist, but effective nonetheless. He planted his charges.

Then he moved on to the Tactics Building, the Bacteriophage Labs, the Central Records Computer block and the Armory. Charged, all.

Then he pullcrawled back to the fence, unshipped the bullhorn, settled himself low so he made no silhouette against the yawning dawn just tingeing itself lightly in the east, and tripped the charges.

The Labs went up first, throwing walls and ceilings skyward in a series of explosions that ranged through the spectrum from blue to red and back again. Then the Computer Block shrieked and died, fizzing and sparking like a dust-circuit killing negative particles; then together the Earth Sciences and Tactics Buildings thundered like saurians and fell in on themselves, spuming dust and lath and plaster and extruded wall-dividers and shards of melting metal. And, at last, the Armory, in a series of moist poundings that locked one after

the other in a stately, yet irregular rhythm. And one enormous Olympian bang that blew the Armory to pieces filling the night with the starburst trails of tracer lightning.

It was all burning, small explosions continuing to firecracker amid the rising sound of students and faculty and troops scurrying through the debacle. It was all burning as Joe Bob turned the gain full on the bull and put it to his mouth and began shouting his message.

"You call this academic freedom, you bunch of earthworms! You call electrified fences and armed guards in your classrooms the path to learning? Rise up, you toadstools! Strike a blow for freedom!"

The bollixer was buzzing, reporting touches from radar probes. It was feeding back mass shape, indistinct lumps, ground swells, anything. Joe Bob kept shouting.

"Grab their guns away from them!" His voice boomed like the day of judgment. It climbed over the sounds of men trying to save other buildings and it thundered against the rising dawn. "Throw the troops off campus! Jefferson said, 'People get pretty much the kind of government they deserve!' Is *this* what you deserve?!"

The buzzing was getting louder, the pulses coming closer together. They were narrowing the field on him. Soon they would have him pinned; at least with high probability. Then the squirt squads would come looking for him.

"Off the troops!

"There's still time! As long as *one* of you isn't all the way brainwashed, there's a chance. *You are not alone!* We are a large, organized resistance movement . . . come join us . . . trash their barracks . . . bomb their armories . . . off the Fascist varks! Freedom is now, grab it, while they're chasing their tails! Off the varks. . . ."

The squirters had been positioned in likely sectors.

When the mini-radar units triangulated, found a potential lurking place and locked, they were ready. His bollixer gave out one solid buzzing pulse, and he knew they'd locked on him. He slipped the bull back on its harness and fumbled for the flap of his holster. It came away with a velcro fabric-sound and he wrenched the squirt gun out. The wire stock was folded across the body of the weapon and he snapped it open, locking it in place.

Get out of here, he told himself.

Shut up, he answered. *Off the varks!*

Hey, pass on that. I don't want to get killed.

Scared, mother chicken?

Yeah I'm scared. You want to get your ass shot up, that's your craziness, you silly wimp. But don't take me *with you!*

The interior monologue came to an abrupt end. Off to Joe Bob's right three squirters came sliding through the crabgrass, firing as they came. It wouldn't have mattered, anyhow. Where Joe Bob went, Joe Bob went with.

The squirt charges hit the fence and popped, snicking, spattering, everywhere but the space Joe Bob had cut out in the shape of a church window. He yanked loose the jumper cable and jammed it into the rucksack, sliding backward on his stomach and firing over their heads.

I thought you were the bigger killer?

Shut up, damn you! I missed, that's all.

You missed, my tail! You just don't want to see blood.

Sliding, sliding, sculling backward, all arms and legs; and the squirts kept on coming. *We are a large, organized resistance movement,* he had bullhorned. He had lied. He was alone. He was the last. After him, there might not be another for a hundred years. Squirt charges tore raw gashes in the earth around him.

Scared! I don't want to get killed.

The chopper rose from over his sight horizon, rose straight up and came on a dead line for his position. He heard a soft, whining sound and *Scared!* breezed through his mind again.

Gully. Down into it. Lying on his back, the angle of the grassy bank obscuring him from the chopper, but putting him blindside to the squirt squad. He breathed deeply, washed his lips with his tongue, too dry to help, and he waited.

The chopper came right over and quivered as it turned for a straffng run. He braced the squirt gun against the bank of the gully and pulled the trigger, held it back as a solid line of charges raced up the air. He tracked ahead of the chopper, leading it. The machine moved directly into the path of fire. The first charges washed over the nose of the chopper, smearing the surface like oxidized chrome plate. Electrical storms, tiny whirlpools of energy flickered over the chopper, crazing the ports, blotting out the scene below to the pilot and his gunner. The squirt charges drank from the electrical output of the ship and drilled through the hull, struck the power source and the chopper suddenly exploded. Gouts of twisted metal, still flickering with squirt life, rained down across the campus. The squirters went to ground, dug in, to escape the burning metal shrapnel.

With the sound of death still echoing, Joe Bob Hickey ran down the length of the gully, into the woods, and gone.

It has been said before, and will be said again, but never as simply or humanely as Thoreau said it: "He serves the state best, who opposes the state most."

(Aluminum acetate, a chemical compound which, in the form of its natural salt, $Al(C_2H_3O_2)_3$, obtained as a white water-soluble amorphous powder, is used chiefly

in medicine as an astringent and as an antiseptic. In the form of its basic salt, obtained as a white, crystalline, water-insoluble powder, it is used chiefly in the textile industry as a waterproofing agent, as a fireproofing agent, and as a mordant. A mordant can be several things, two of the most important being an adhesive substance for binding gold or silver leaf to a surface; and an acid or other corrosive substance used in etching to eat out the lines.)

Joe Bob Hickey as aluminum acetate. Mordant. Acid etching at a corroded surface.

Deep night found him in terrible pain, far from the burning ruin of the University. Stumbling beneath the gargantuan Soleri pylons of the continental tramway. Falling, striking, tumbling over and over in his stumble. Down a gravel-bed into deep weeds and the smell of sour creek. Hands came to him in the dark, and turned him face-up. Light flickered and a voice said, "He's bleeding," and another voice, cracked and husky, said, "He's sideing a squirter," and a third voice said, "Don't touch him, come on," and the first voice said again, "He's bleeding," and the light was applied to the end of a cigar stub just as it burned down. And then there was deep darkness again.

Joe Bob began to hurt. How long he had been hurting he didn't know, but he realized it had been going on for some time. Then he opened his eyes, and saw firelight dancing dimpling dimly in front of him. He was propped up against the base of a sumac tree. A hand came out of the mist that surrounded him, seemed to come right out of the fire, and a voice he had heard once before said, "Here. Take a suck on this." A plastic bottle of something hot was held to his lips, and another hand he could not see lifted his head slightly, and he drank. It was a kind of soupness that tasted of grass.

But it made him feel better.

"I used some of the shpritz from the can in your knapsack. Something got you pretty bad, fella. Right across the back. You was bleeding pretty bad. Seems to be mending okay. That shpritz."

Joe Bob went back to sleep. Easier this time.

Later, in a softer, cooler time, he woke again. The campfire was out. He could see clearly what there was to see. Dawn was coming up. But how could that be . . . another dawn? Had he run all through the day, evading the varks sent to track him down? It had to be just that. Dawn, he had been crouched outside the fence, ready to trip the charges. He remembered that. And the explosions. And the squirt team, and the chopper, and—

He didn't want to think about things falling out of the sky, burning, sparking.

Running, a full day and a night of running. There had been pain. Terrible pain. He moved his body slightly, and felt the raw throb across his back. A piece of the burning chopper must have caught him as he fled; but he had kept going. And now he was here, somewhere else. Where? Filtered light, down through cool waiting trees.

He looked around the clearing. Shapes under blankets. Half a dozen, no, seven. And the campfire just smoldering embers now. He lay there, unable to move, and waited for the day.

The first one to rise was an old man with a dirty stipple of beard, perhaps three days' worth, and a poached egg for an eye. He limped over to Joe Bob—who had closed his eyes to slits—and stared at him. Then he reached down, adjusted the unraveling blanket, and turned to the cooling campfire.

He was building up the fire for breakfast when two of the others rolled out of their wrappings. One was quite tall, wearing a hook for a hand, and the other was as

old as the first man. He was naked inside his blankets, and hairless from head to foot. He was pink, very pink, and his skin was soft. He looked incongruous: the head of an old man, with the wrinkled, pink body of a week-old baby.

Of the other four, only one was normal, undamaged. Joe Bob thought that till he realized the normal one was incapable of speech. The remaining three were a hunchback with a plastic dome on his back that flickered and contained bands of color that shifted and changed hue with his moods; a black man with squirt burns down one entire side of his face, giving him the appearance of someone standing forever half in shadow; and a woman who might have been forty or seventy, it was impossible to tell, with one-inch wide window strips in her wrists and ankles, whose joints seemed to bend in the directions opposite normal.

As Joe Bob lay watching surreptitiously, they washed as best they could, using water from a Lister bag, avoiding the scum-coated and bubbling water of the foul creek that crawled like an enormous gray potato slug through the clearing. Then the old man with the odd eye came to him and knelt down and pressed his palm against Joe Bob's cheek. Joe Bob opened his eyes.

"No fever. Good morning."

"Thanks," Joe Bob said. His mouth was dry.

"How about a cup of pretty good coffee with chickory?" The old man smiled. There were teeth missing.

Joe Bob nodded with difficulty. "Could you prop me up a little?" The old man called, "Walter . . . Marty . . ." and the one who could not speak came to him, followed by the black man with the half-ivory face. They gently lifted Joe Bob into a sitting position. His back hurt terribly and every muscle in his body was stiff from having slept on the cold ground. The old man handed Joe Bob a plastic milk bottle half-filled with coffee. "There's no

cream or sugar, I'm sorry," he said. Joe Bob smiled thanks and drank. It was very hot, but it was good. He felt it running down inside him, thinning into his capillaries.

"Where am I? What is this place?"

"N'vada," said the woman, coming over and hunkering down. She was wearing plowboy overalls chopped short at the calves, held together at the shoulders by pressure clips.

"Where in Nevada?" Joe Bob asked.

Oh, about ten miles from Tonopah."

"Thanks for helping me."

"I dint have nothin' to do with it at all. Had my way, we'd've moved on already. This close to the tramway makes me nervous."

"Why?" He looked up; the aerial tramway, the least impressive of all Paolo Soleri's arcologies, and even by that comparison breathtaking, soared away to the horizon on the sweep-shaped arms of pylons that rose an eighth of a mile above them.

"Company bulls, is why. They ride cleanup, all up'n down this stretch. Lookin' for saboteers. Don't like the idea them thinkin' we's *that* kind."

Joe Bob felt nervous. The biggest patriots were on death row. Rape a child, murder seven women, blow the brains out of an old shopkeeper, that was acceptable; but be anti-country and the worst criminals wanted to wreak revenge. He thought of Greg, who had been beaten on Q's death row, waiting on appeal, by a vark-killer who'd sprayed a rush-hour crowd with a squirter, attempting to escape a drugstore robbery that had gone sour. The vark-killer had beaten Greg's head in with a three-legged stool from his cell. Whoever these people were, they weren't what *he* was.

"Bulls?" Joe Bob asked.

"How long you been onna dodge, boy?" asked the in-

credibly tall one with the hook for a hand. "Bulls. Troops. The Man."

The old man chuckled and slapped the tall one on the thigh. "Paul, he's too young to know those words. Those were our words. Now they call them . . ."

Joe Bob linked in to the hesitation. "Varks?"

"Yes, varks. Do you know where that came from?"

Joe Bob shook his head.

The old man settled down and started talking, and as if he were talking to children around a hearth, the others got comfortable and listened. "It comes from the Dutch Afrikaan foe earth-pig, or aardvark. They just shortened it to vark, don't you see."

He went on talking, telling stories of days when he had been younger, of things that had happened, of their country when it had been fresher. And Joe Bob listened. How the old man had gotten his poached egg in a government medical shop, the same place Paul had gotten his metal hook, the same place Walter had lost his tongue and Marty had been done with the acid that had turned him half-white in the face. The same sort of medical shop where they had each suffered. But they spoke of the turmoil that had ended in the land, and how it was better for everyone, even for roaming bands like theirs. And the old man called them bindlestiffs, but Joe Bob knew whatever that meant, it wasn't what *he* was. He knew one other thing: it was *not* better.

"Do you play Monopoly?" the old man asked.

The hunchback, his plastic dome flickering in pastels, scampered to a roll-up and undid thongs and pulled out a cardboard box that had been repaired many times. Then they showed Joe Bob how to play Monopoly. He lost quickly; gathering property seemed a stupid waste of time to him. He tried to speak to them about what was happening in America, about the abolition of the Pentagon Trust, about the abolishment of the Supreme

Court, about the way colleges trained only for the corporations or the Trust, about the central computer banks in Denver where everyone's identity and history were coded for instant arrest, if necessary. About all of it. But they knew that. They didn't think it was bad. They thought it kept the sabooters in their place so the country could be as good as it had always been.

"I have to go," Joe Bob said, finally. "Thank you for helping me." It was a stand-off: hate against gratitude.

They didn't ask him to stay with them. He hadn't expected it.

He walked up the gravel bank; he stood under the long bird-shadow of the aerial tramway that hurtled from coast-to-coast, from Gulf to Great Lakes, and he looked up. It seemed free. But he knew it was anchored in the earth, deep in the earth, every tenth of a mile. It only *seemed* free, because Soleri had dreamed it that way. Art was not reality, it was only the appearance of reality.

He turned east. With no place to go but more of the same, he went anywhere. Till thunder crashed, in whatever dark closet.

Convocation, at the State University of New York at Buffalo, was a catered affair. Catered by varks, troops, squirters and (Joe Bob, looking down from a roof, added) bulls. The graduating class was eggboxed, divided into groups of no more than four, in cubicles with clear plastic walls. Unobstructed view of the screens on which the President Comptroller gave his address, but no trouble for the quellers if there was trouble. (There had been rumors of unrest, and even a one-page hectographed protest sheet tacked to the bulletin boards on campus.)

Joe Bob looked around with the opera glasses. He was checking the doggie guards.

Tenure and status among the faculty were indicated by the size, model and armament of the doggie guard robots that hovered, humming softly, just above and to the right shoulder of every administrator and professor. Joe Bob was looking for a 2013 Dictograph model with mist sprayers and squirt nozzles. Latest model . . . President Comptroller.

The latest model down there in the crowd was a 2007. That meant it was all assistant profs and teaching guides.

And *that* meant they were addressing the commencement exercises from the studio in the Ad Building. He slid back across the roof and into the gun tower. The guard was still sleeping, cocooned with spinex. He stared at the silver-webbed mummy. They would find him and spray him with dissolvent. Joe Bob had left the nose unwebbed; the guard could breathe.

Bigger killer!

Shut up.

Effective commando.

I told you to shut the hell up!

He slipped into the guard's one-piece stretchsuit, smoothed it down the arms to the wrists, stretching it to accommodate his broader shoulders. Then, carrying the harness and the rucksack, he descended the spiral staircase into the Ad Building proper. There were no varks in sight inside the building. They were all on perimeter detail, it was a high caution alert: commencement day.

He continued down through the levels to the central heating system. It was June. Hot outside. The furnaces had been damped, the airconditioners turned on to a pleasant 71° throughout the campus. He found the schematic for the ducts and traced the path to the studio with his finger. He slipped into the harness and rucksack, pried open a grille and climbed into the sys-

tem. It was a long, vertical climb through the ductwork. Climbing—

20 do you remember the rule that was passed into law, that nothing could be discussed in open classes that did not pertain directly to the subject matter being taught that day 19 and do you remember that modern art class in which you began asking questions about the uses of high art as vehicles for dissent and revolution 18 and how you began questioning the professor about Picasso's *Guernica* and what fever it had taken to paint it as a statement about the horrors of war 17 and how the professor had forgotten the rule and had recounted the story of Diego Rivera's Rockefeller Center fresco that had been commissioned by Nelson Rockefeller 16 and how, when the fresco was completed, Rivera had painted in Lenin prominently, and Rockefeller demanded another face be painted over it, and Rivera had refused 15 and how Rockefeller had had the fresco destroyed 14 and within ten minutes of the discussion the Comptroller had had the professor arrested 13 and do you remember the day the Pentagon Trust contributed the money to build the new stadium in exchange for the Games Theory department being converted to Tactics and they renamed the building Neumann Hall 12 and do you remember when you registered for classes and they ran you through Central and found all the affiliations and made you sign the loyalty oath for students 11 and the afternoon they raided the basement 10 and caught you and Greg and Terry and Katherine 9 and they wouldn't give you a chance to get out and they filled the basement with mist 8 and they shot Terry through the mouth and Katherine 7 and Katherine 6 and Katherine 5 and she died folded up like a child on the sofa 4 and they came in and shot holes in the door from the inside so it looked like you'd been firing back at them 3 and they took you and Greg

into custody and the boot and the manacles and the confessions and you escaped and ran 1

Climbing—

Looking out through the interstices of the grille. The studio. Wasn't it fine. Cameras, sets, all of them—fat and powdered and happy. The doggies turning turning above their shoulders in the air turning and turning.

Now we find out just how tough you really are.

Don't start with me!

You've got to actually kill someone now.

I know what I've got to do.

Let's see how your peace talk sits with butchering someone—

Damn you!

—in cold blood, isn't that what they call it?

I can do it.

Sure you can. You make me sick.

I can: I can do it. I have to do it.

So do.

The studio was crowded with administrative officials, with technicians, with guards and troops, with mufti-laden military personnel looking over the graduating class for likely impressedmen. And in the campus brig, seventy feet beneath the Armory, eleven students crouched in maximum security monkey cages: unable to stand, unable to sit, built so a man could only crouch, spines bowed like bushmen in an outback.

With the doggies scanning, turning and observing, ready to fire, it was impossible to grab the President Comptroller. But there was a way to confound the robot guards. Wendell had found the way at Dartmouth, but he'd died for the knowledge. But there *was* a way.

If a man does the dying for you.

A vark. If a vark dies.

They die the same.

He ignored the conversation. It led nowhere; it never led anywhere but the same. The squirt gun was in his hands. He lay flat, spread his legs, feet turned out, and braced the wire stock against the hollow of his right shoulder. In the moment of light focused in the scope, he saw what would happen in the next seconds. He would squirt the guard standing beside the cameraman with the arriflex. The guard would fall and the doggies would be alerted. They would begin scanning, and in that moment he would squirt one of them. It would short, and begin spraying. The other doggies would home in, begin firing among themselves, and in the ensuing confusion he would kick out the grille, drop down and capture the Comptroller. If he was lucky. And if he was further lucky, he would get away with him. Further, and he would use him as ransom for the eleven.

Lucky! You'll die.

So I'll die. They die, I die. Both ways, I'm tired.

All your words, all your fine noble words.

He remembered all the things he had said through the bullhorn. They seemed far long lost and gone now. It was time for final moments. His finger tightened on the trigger.

The moment of light lengthened.

The light grew stronger.

He could not see the studio. The glare of the golden light blotted everything. He blinked, came out from behind the squirt gun and realized the golden light was there with him, inside the duct, surrounding him, heating him, glowing and growing. He tried to breathe and found he could not. His head began to throb, the pressure building in his temples. He had a fleeting thought—it was one of the doggies: he'd been sniffed out and this was some new kind of mist, or a heat-ray, or something new he hadn't known about. Then everything blurred

out in a burst of golden brightness brighter than anything he had ever seen. Even lying on his back as a child, in a field of winter wheat, staring up with wide eyes at the sun, seeing how long he could endure. Why was it he had wanted to endure pain, to show whom? Even brighter than that.

Who am I and where am I going?

Who he was: uncounted billions of atoms, pulled apart and whirled away from there, down a golden tunnel bored in saffrom space and ochre time.

Where he was going:

Joe Bob Hickey awoke and the first sensation of many that cascaded in on him was one of swaying. On a tideless tide, in air, perhaps water, swinging, back and forth, a pendulum movement that made him feel nauseous. Golden light filtered in behind his closed lids. And sounds. High musical sounds that seemed to cut off before he had heard them fully to the last vibrating tremolo. He opened his eyes and he was lying on his back, on a soft surface that conformed to the shape of his body. He turned his head and saw the bullhorn and rucksack lying nearby. The squirt gun was gone. Then he turned his head back, and looked straight up. He had seen bars. Golden bars reaching in arcs toward a joining overhead. A cathedral effect, above him.

Slowly, he got to his knees, rolling tides of nausea moving in him. They were bars.

He stood up and felt the swaying more distinctly. He took three steps and found himself at the edge of the soft place. Set flush into the floor, it was a gray-toned surface, a huge circular shape. He stepped off, onto the solid floor of the . . . of the cage.

It *was* a cage.

He walked to the bars and looked out.

Fifty feet below was a street. A golden street on

which great bulb-bodied creatures moved, driving before them smaller periwinkle blue humans, whipping them to push-and-pull the sitting carts on which the golden bulb creatures rode. He stood watching for a long time.

Then Joe Bob Hickey went back to the circular mattress and lay down. He closed his eyes, and tried to sleep.

In the days that followed, he was fed well, and learned that the weather was controlled. If it rained, an energy bubble—he didn't understand, but it was invisible—would cover his cage. The heat was never too great, nor was he ever cold in the night. His clothes were taken away and brought back very quickly . . . changed. After that, they were always fresh and clean.

He was someplace else. They let him know that much. The golden bulb creatures were the ruling class, and the smaller blue people-sorts were their workers. He was very someplace else.

Joe Bob Hickey watched the streets from his great swaying cage, suspended fifty feet above the moving streets. In his cage he could see it all. He could see the golden bulb rulers as they drove the pitiful blue servants and he never saw the face of one of the smaller folk, for their eyes were constantly turned toward their feet.

He had no idea why he was there.

And he was certain he would stay there forever.

Whatever purpose they had borne in mind, to pluck him away from his time and place, they felt no need to impart to him. He was a thing in a cage, swinging free, in prison, high above a golden street.

Soon after he realized this was where he would spend the remainder of his life, he was bathed in a deep yellow light. It washed over him and warmed him, and

he fell asleep for a while. When he awoke, he felt better than he had in years. The sharp pains the shrapnel wound had given him regularly had ceased. The wound had healed over completely. Though he ate the strange, simple foods he found in his cage, he never felt the need to urinate or void his bowels. He lived quietly, wanting for nothing, because he wanted nothing.

Get up, for God's sake. Look at yourself.

I'm just fine. I'm tired, let me alone.

He stood and walked to the bars. Down in the street, a golden bulb creature's rolling cart had stopped, almost directly under the cage. He watched as the blue people fell in the traces, and he watched as the golden bulb thing beat them. For the first time, somehow, he saw it as he had seen things before he had been brought to this place. He felt anger at the injustice of it; he felt the blood hammering in his neck; he began screaming. The golden creature did not stop. Joe Bob looked for something to hurl. He grabbed the bullhorn and turned it on and began screaming, cursing, threatening the monster with the whip. The creature looked up and its many silver eyes fastened on Joe Bob Hickey. *Tyrant, killer, filth!* he screamed.

He could not stop. He screamed all the things he had screamed for years. And the creature stopped whipping the little blue people, and they slowly got to their feet and pulled the cart away, the creature following. When they were well away, the creature rolled once more onto the platform of the cart, and whipped them away.

"Rise up, you toadstools! Strike a blow for freedom!"

He screamed all that day, the bullhorn throwing his voice away to shatter against the sides of the windowless golden buildings.

"Grab their whips away from them! Is *this* what you deserve?! There's still time! As long as *one* of you isn't all the way beaten, there's a chance. *You are not alone!*

We are a large, organized resistance movement. . . ."

They aren't listening.

They'll hear.

Never. They don't care.

Yes! Yes, they do. Look! See?

And he was right. Down in the street, carts were pulling up and as they came within the sounds of his voice the golden bulb creatures began wailing in terrible strident bug voices, and they beat themselves with the whips . . . and the carts started up again, pulled away . . . and the creatures beat their blue servants out of sight.

In front of him, they wailed and beat themselves, trying to atone for their cruelty. Beyond him, they resumed their lives.

It did not take him long to understand.

I'm their conscience.

You were the last they could find, and they took you, and now you hang up here and pillory them and they beat their breasts and wail mea culpa, mea maxima culpa, and they purge themselves; then they go on as before.

Ineffectual.

Totem.

Clown, I'm a clown.

But they had selected well. He could do no other.

As he had always been a silent voice, screaming words that needed to be screamed, but never heard, so he was still a silent voice. Day after day they came below him, and wailed their guilt; and having done it, were free to go on.

The deep yellow light, do you know what it did to you?

Yes.

Do you know how long you'll live, how long you'll tell

them what filth they are, how long you'll sway here in this cage?

Yes.

But you'll still do it.

Yes.

Why? Do you like being pointless?

It isn't pointless.

Why not, you said it was. Why?

Because if I do it forever, maybe at the end of forever they'll let me die.

(The Black-headed Gonolek is the most predatory of the African bush shrikes. Ornithologically, the vanga-shrikes occupy somewhat the same position among the passerines that the hawks and owls do among the nonpasserines. Because they impale their prey on thorns, they have earned the ruthless name "butcher-bird." Like many predators, shrikes often kill more than they can eat, and when opportunity presents itself seem to kill for the joy of killing.)

All was golden light and awareness.

(It is not uncommon to find a thorn tree or barbed-wire fence decorated with a dozen or more grasshoppers, locusts, mice or small birds. That the shrike establish such larders in times of plenty against future need has been questioned. They often fail to return, and the carcasses slowly shrivel or rot.)

Joe Bob Hickey, prey of his world, impaled on a thorn of light by the shrike, and brother to the shrike himself.

(Most bush shrikes have loud, melodious voices and reveal their presence by distinctive calls.)

He turned back to the street, putting the bullhorn to his mouth and, alone as always, he screamed, "Jefferson said—"

From the golden street came the sounds of insect wailing.

FRIEND OF THE COURT

It is hard to say anything meaningful about a writer who uses a pseudonym, because the meaningful things may blow the cover on the identity he wants to conceal. (There are three like that in this volume, which complicates my life more than you would think.) All I can tell you about H. H. Hollis is that he is a legal gentleman who has a career that he does not want to involve with his science-fiction career. He bends the bars a little from time to time, because he knows full well what writers are, and so he runs clinics in the SFWA publications (the SFWA, if you didn't know, is the Science Fiction Writers of America, trade union of sf authors) helping writers with legal problems to untangle them. But the bars are still there.

All you need to know about him as a writer, in the long run, is what you read in his stories, anyway. And you can do that with no further introduction at all. . . .

TOO MANY PEOPLE
by H. H. Hollis

I

"Kill—kill it—"

"Look for a patch of white, Jake, and fire into it."

Yacov HarShawkor found himself in a nightmare when he returned from the New Delhi conference. Charles Perry handed him a loaded M-16 as they ran. Heavy handguns roared around the two men. At the lab compound, floodlights flared in useless brilliance. Here, in the dark of the South Indian interior plain, there were

only running feet, harsh cries in Tamil and English. "There! Shoot, shoot!" and laboring breaths as they pursued the escapee from the laboratory.

"What's white, Charlie? What am I aiming at?"

"Mary's hospital gown! She got out."

Yacov came to a full stop, clutching the carbine. My god, he thought, Mary. A week ago . . . and Charlie expects us to kill her. He's loved her all these years and he wants to kill her. For what? Yacov knew and was cold all through with the knowledge.

"Charlie—" he yelled at the running figure ahead. "You got a stable vector for the virus?"

"Yes, yes," Charles groaned as he slowed, .358 Magnum clutched in his right hand. "Yes, and Mary has it—but the process is not stable. We have to kill her. Do you think I relish it?"

They stood very close, breathing with the deep shudders of men not often called to sustained physical effort. "Yes," Yacov said bitterly. "Yes, I think you do, you jealous—"

"No. You don't understand. We can't control the virus in a female. That's not Mary out there. It's the end of the human race." He pointed the handgun. "I'll kill you, too, if I have to; but I'm going to burn Mary's dead body tonight; and afterwards I'm going to cremate the ashes and the dirt where she falls."

Yacov knew what might have happened as each stood with the other's death in his hand; a half-mile ahead of them in the black night shots rang out near the bank of the broad river. Shouts of triumph overlaid a wavering scream of pain and terror. In a moment the wiry Indian majordomo of the great laboratory ran back to them.

"She is dead, gentlemen. Dr. Subchundrum is looking for a boat to see if the crocodiles have left anything. I believe I hit her—and I know Dr. Subchundrum did. I

saw her stagger just before she went over the bluff, I am sorry."

The searchers at the river brought back nothing. For the rest of the night three scientists sat in the ascetic mess hall of their laboratory, passing the station's lone bottle of gin back and forth and mourning the loss of Mary Braden, with whom each had been in love at some time and in some fashion.

Memories were traded like snapshots, each serving for a moment to hold off from the three the actual deadness, the nonexistence, of the woman whose life had been entwined with theirs. The mutual magnet which had swept them all together as students was a consuming interest in the mechanics of population control. At a great Boston university, Patasayjit Subchundrum, Charles Perry and Yacov HarShawkor—known to his friends as Yankele—had made a wheel of intellect and adolescent lust revolving around Mary Braden's passionate involvement in the struggle of heart and head for a policy by which humanity could live on the planet Earth without eating itself.

Attending what all had expected to be a dreary bore of "getting to know your faculty," they met at the home of one Professor Hoogert.

"Ecological balance," Hoogert said, "is not long denied."

He said so to old students and new. He said so in class and out of it. On this social occasion he said so to his four young guests. And they accepted the words as the axiom on which to build their lives.

"In the generation before mine," Hoogert also said, "your grandparents and great-grandparents were the scar-that-couldn't-be-seen. They all believed hunger was just around the corner. In your generation, even Mr. Subchundrum, who comes from a country where famine is still real, is somehow unmarked by fear. Although mil-

lions of people have starved in India in the last decade, we all feel that in some way the problem of hunger is going to be solved."

Subchundrum, a thin, ravishingly handsome young hellion with a skin the color of sandalwood and the dark brown eyes of a fawn, rose to the invitation.

"Well, Doctor, famine disturbs one more as one approaches becoming a participant in it. For people who cannot grow grain and cannot get grain and have indeed forgotten what grain looks like, it is a more gripping experience than for a scholar who is living in the land of the obese."

Dr. Hoogert had grimaced. "I don't feel guilt. I have not chosen that any should starve—and no mouthful of food I might deny myself would add one calorie to the diet of a Calcutta slum dweller."

His wife murmured, "No, but it might smooth out that unsightly paunch." She deftly whipped the cake plate from her husband's elbow and placed it in front of the young Indian student.

Mary Braden, hair hanging over one eye, spoke then in the different manner on which girls of her generation relied to disarm opponents. "Oh, I see what you mean, Mrs. Hoogert—it isn't our personal food intake that helps or hurts the starving. But food is so important in our society—more important than sex, really—that if we could just bring ourselves to the point of general self-denial we might generate a political solution to the food problem. Another famine might never be allowed in India or Brazil."

Mrs. Hoogert shot a sharp glance at Mary.

"More important than sex? Pooh, only a virgin would make a remark like that."

"Well, my dear," said Professor Hoogert, "if I have to choose between a fat paunch and a fat head, I'll just keep my little corporation. I think you've made Mary

blush. I think the state of Mary Braden's virginity is a subject which must be pursued elsehwere. Mary, my dear, do you think that *any* division of the world's food supply would suffice to sustaining the teeming millions?"

He smiled at her.

Mary Braden shook her head. "No, I mean that if people here voluntarily felt the edge of hunger, it might stimulate them to solve the problem."

Subchundrum said seriously, "Yes, but there is some evidence that the blind response of our genes to hunger itself stimulates the pressure to breed. Starving people produce more offspring than well-fed people do."

"So? Make birth-control a legal concomitant of marriage," Charles said. "When Mary and Yanekele wed, they ought to be assigned a quota. Any more and crunch! No food for anybody in the family."

Mary impulsively leaned over and put her hand on Yacov's. "We might be relied on—but people who are hungry every day? I don't think they can be counted on to be rational or to obey quotas. We ought to find out."

Yacov's hand turned up and tightened on hers. "Marriage doesn't equal children. Children require to protect them through the plastic learning period. But they don't need it to be born. Or to go hungry."

Charles laid his hand on top of theirs. "Shall we make nonreproduction a three-way pledge? Oh, sorry." His eye fell on Subchundrum. "Four-way, if you like?"

Subchundrum smiled. "I abstain, as my ambassador often does at the UN. We preserve later freedom of action in this way."

Professor Hoogert was preserving his own freedom of action by stuffing a pipe. He spoke while puffing the tobacco alight.

"It isn't a bad thing to recognize—that—birth-control—is not likely—to come—from simple plans—like marital abstinence. Some compulsion is needed, eh?" He

glanced around the circle. "Yes. Well. Just so. I have caused the four of you to meet because each of you has betrayed some interest in the population problem. I hoped each of you would start a chain reaction in the other three. As a catalyst I seem to have performed my function."

"He means," his wife said, stroking the back of his neck, "that he is a spent catalyst."

"Sir," said Charles, "you never told us what you feel is the distinguishing mark of *your* generation. After all, you're handing down the problem."

"Why, we are the fulminate of war," Hoogert said. "Strike one of us and see the mushroom cloud. We sought peace in murder and found another of the paradoxes of history. We killed more people in our years than the whole human population of the world had been five hundred years earlier, yet we leave Earth more crowded with human animals than when we began to kill. So we have led directly to you. This world cannot tolerate the numerical dominance of any one beast at our level. Ecological balance is not long denied."

"What are we?" asked Yacov, looking around at his three contemporaries.

"Cannibals. In the most literal sense. You will eat yourselves if a valve for population pressure is not found or fashioned. This is the great fact of human life which marks and will mark every one of you."

Yacov and Mary looked at each other.

"Cannibals?" she murmured dreamily.

"Valve?" asked Charles Perry. "You don't say solution, or reduction. Valve?"

"He means," Subchundrum said, "that there is more than one way of relieving a pressure."

"More than that," Professor Hoogert said. "I want to make it clear that I think man is still an evolving animal. Whether we take the position that, having evolved

the brain, man has come to the end of his individual physical evolution and can hope to progress only by social evolution, by the elaboration of societies better adapted to the needs of humanity; or that there is still significant genetic change in man's future—either way the pressure of population is important. It is one of the factors leading to physical evolution by the vast exchange of the gene pool and its exposure to the forces of mutation; or it is one of the factors to make us use our brains to invent the more human society which may lie in our future. What you must seek in your generation is a way to control population pressure in helping to determine man's future."

"Of course," said Yacov, "everybody knows all we have to do is get every nation up to the level of affluence of the great industrial nations and the birth rate falls."

Mary Braden said, "Mexico? Gross national product rising every year, population rising at a steady four percent right with it."

"Well! it just hasn't gone on long enough. Give them a generation."

"Thirty years?" asked Subchundrum. "In thirty years, even if we could reduce *my* country's annual rate of population growth to one and a half percent, we should have eight hundred and fifty million people. At the current rate of better than three percent, which is likely to endure, our population is in the year two thousand will be one billion people."

Professor Hoogert nodded. "So where's the valve?"

Charles Perry laughed. "Well, it's just a matter of finding it. Some simple mechanical way that the most ignorant will use to inhibit conception."

Yacov shook his head. Mary said, very seriously, "But if we did find a mechanical way—the pill is controversial but effective and the plastic loop is simple and cheap—how could we persuade people to use it? For

some people known methods are painful or frightening or anti-religious. How do we get over all those hurdles at once?"

Charles replied, "Lock the food supply to contraception. A woman would have to show proof she's using one method or another in order to get her family's issue of food for the month."

"Subchundrum snorted. "Charles, forgive me. You are a child of industrialism, of close-living populations already managed in so many ways that one more won't matter. Everybody in the United States is trained to mass transportation, mass work places, computer use. The dial telephone alone conditions every American to mass utilization of computers; and the keeping of computer records, in credit, in school, in public agencies, trains ordinary citizens not to cheat and not to forget to do the things that make the computer tick: include this portion of bill with your check, return this stub with questionnaire fully filled out, check every answer either yes or no—do not fold, spindle or mutilate. I know the following is hard for you to visualize but try to get hold of the idea that sixty percent of Mexico's people live in villages of fewer than a thousand souls; eighty percent of my people the same. Try to accept that such people are both ignorant and sly and that they have a cultural tradition that rule-breaking can almost always be fixed by an uncle or friend with influence.

"Such people lose count honestly. They forget what the count means; if they're following the rhythm method, they can't remember which day is safe and which isn't; or they think the act of counting makes the process safe. If they're using pills, they mismatch days with pills and destroy the effectiveness of the cycle of pills. They lose the strings of beads we give them to match the count. They lose the pills themselves or one of the babies swallows them and mother is ashamed to

admit it and ask for more; or the distributor only comes to the village once a month or once a quarter.

"All these things happen just by the human carelessness of people in a peasant culture. But people don't expect to be punished by starvation just for making a human error in a count. You can't hook food supply to pill usage. In the first place, neither my people nor yours would accept it. They'd simply revolt, if it were really enforced. But it couldn't be enforced. One married woman would just share food with another, knowing that next month the need for sharing because of a counting error might be the other way around."

"My God," said Charles, "what an impassioned speech. You nearly make me believe the problem can't be solved."

"No, he doesn't mean that," said Yacov. "And he hasn't even touched on religious objections to the kind of inhumane coercion you proposed. He means it takes more than good will and more than technical ingenuity to get the job done."

Mary asked, "Do you mean that it takes more even than compulsion?"

Subchundrum looked at them all with something deep and dark struggling for expression in his red-brown eyes. Then he shrugged, as if he were unable or unwilling to put into words what he felt.

II

In the shifting social life of a great university and a great city, Charles and Yacov squired many young girls to the theater, to dances, to protest meetings and picket lines—all the rich variety of American student life in the 'sixties. Mary Braden worked her way through a score of admirers outside their circle; but as the undergraduate years slid swiftly by, more and more of

her time, even outside class and lab, was spent with Yacov or with Charles—or with Subchundrum, although he ostensibly removed himself from sexual competition early in the game. Back home in Kerala awaited the bride to whom his parents had plighted his troth when he was six years old.

In senior years, even their continuing and deepening interest in the population problem could not prevent their being drawn into different vortices of scientific specialization; but their separation in discipline drew them back together to exchange and enrich each other's ideas. The childless home of the Hoogerts became their home. At various times, one or more of them boarded there.

Once, when Mary was living with the Hoogerts and the other three had come over for Sunday night supper, they examined plastic loops, various small shapes of molded nylon and polyethlene which inhibited conception when placed in a woman's uterus. The theory was that intra-uterine devices were painless and could remain in place for years. When the time came for the planned family, they could be removed at once without side effects and without further inhibition of the process of reproduction. Mary flung down a sheaf of statistics purporting to indicate that the IUD was less effective in underdeveloped countries than in highly industrialized ones.

"Look at that, Subchundrum!" she said. "In the southern part of India the damned things are said by women to be painful. The body processes expel them. Even when they're in place, they don't work as well as they do in the United States. How can that be?"

Charles leaned forward, his arm around Mary—he was the favored one that semester—and picked up one of the devices.

"Maybe women in India just don't accept the idea."

"Superstitious, you mean?" asked Yacov, lying on the floor, his feet up on a chair.

Subchundrum laughed. "Superstition is involved—but European superstition. You people from big industrial countries believe a smooth, molded piece of plastic can do anything; so why should it not inhibit birth? My people know it is painful and unnatural—so they expel or remove it."

"Yes," Mary said, "I can see that. The real point is that, objectively, it's effective and pain-free. Now how do we educate the women of underdeveloped countries to know that?"

Subchundrum glowered. "Objective human experience is white, temperate-zone, college-educated experience. You still believe that, don't you? All you pink ones, you just can't get outside your own crippling, anti-human culture to understand that any other human culture is just as valid as yours."

"Oh, come on, Sayji, that's not the implication, meant or unmeant." Yacov sat up and rested on one elbow, feet still in the chair. "It *is* a problem of education. It's hard for people in a village who never see more than a thousand other persons in their lives to understand that by doubling *their* number, they're doubling three and a half or four billion more. It *is* a problem of education."

Subchundrum stood up. "I could say that too many girls are being born and are growing up to child-bearing age so quickly and in such illiteracy that we can never reach them by any process of education. But I'll just say good night." The door slammed behind him before anyone could move. He was back the next week, however.

Months later, the picture was the same, except that Yacov sat next to Mary and Charles was leaning back in a chair, noisily grinding an apple to death. Patasayjit

Subchundrum was bearing down on the destructive role that free will played in their joint interest.

"So long as we expect people, by some act of will, to overcome the deepest instinct of life, we are simply whistling in the dark. People are not going to cut down their own reproduction when it always seems to be someone else who menaces the world. We are running right into the most basic human urge."

Charles said, "But Sayji, human beings are more than any bundle of instinctual drives. What has made us human is our ability to suppress animal drives for long-range goals."

"Yes," said Mary, "but those long-range goals have always been the good of the immediate family—or at most of the tribe or nation."

"Nationalism is tribalism," Yacov declared.

"Even in Israel?" asked Subchundrum.

To which Mary replied, turning protectively toward Yacov, "Yes, even in Zionism; but that's a different situation. Israel is the carrier of the modern tradition. The sheikdoms that surround her are still in the Middle Ages."

"So!" Subchundrum cried. "That gives the Israelis license to outbreed their neighbors? Eh, eh, Yankele?"

"Oh, hell, no. But the situation is special."

"All situations are special," Charles mused as he worked the last shreds off his apple core.

"Right." Mary sat up out of the circle of Yacov's arm. "That's why the whole emphasis of the struggle has to be on education. We've got to make people want to have fewer children. But how?"

"Or can we?" asked Subchundrum. "Can we, in time? You all scoff, more or less, at the efforts of my government; but we have ten times as many lecturers holding clinics and demonstrating the pill, the loop, the rhythm method, as any other country. We offer people the

choice of method and our demonstrations are convincing because they are conducted in slums, country and city, where waves of children with big bellies and sad eyes are always washing around the ankles of the women in the audience. We educate the men, too, but what measurable good does it do us? We may be slowing down the rate of increase but we are hardly denting the increase in absolute numbers. Every time you eat an apple, Charles, another thousand Indians begin to wail and starve."

Charles licked his fingers. "I say what Hoogie told us a long time ago. No use appealing to me to eat less. That won't stem the tide of hunger in Madras."

"Yes," said Mary, always fair. "You're right. You're right, in our terms. In terms of the whole problem of human population on the planet earth, you're wrong. Animals react to starvation pressure by dropping more cubs. So do human beings."

Yacov said what one or the other of them had said a thousand times. "Human beings *are* animals. To that extent, instinctual drives do move great numbers of people. Unless we can educate them all to stand against those drives, we can never hope to correct the upward curve of the population figures, never, never."

Graduation came, degrees and honors, graduate school, jobs in separated corners of the world. Subchundrum invited them all to be his guests in Mexico at a conference on population control methods, sending out a round-robin letter in which he hinted broadly that he had found a new method, and that it might be *the* method.

When they all assembled at Subchundrum's country home in Cauhtla, he teased them first with mysterious glances, insisted on two rounds of tequila sours and then began, inexplicably, to reminisce about his boy-

hood in Kerala, at the tip of the Indian subcontinent.

"Cauhtla is like home in many ways. The mountain elevation is homelike and the sweaty hand of the tropics, so much more felt here than in Cuernavaca, three hundred meters higher, also makes me feel at home."

Yacov said, "Sayji, I flew five thousand kilometers to get here and left my two last classes of the semester to be taught by my assistant, a young woman of such monumental stupidity as only American university politics could saddle me with. I can't stay for the whole conference. Tell us about your new chemical agent and let's get to the testing."

"You think it is chemical?"

'Well, you're working for the largest producer of synthetic hormones in the world. Makes sense that your research ought to benefit your employer some way."

Sayji chuckled. "You ought to know someone raised in Kerala would not have any slavish adherence to the idea of profits for the employer. And this is a Mexican employer. The outfit can only fire me for cause—and pursuing a line of research that will not benefit the corporation is not cause."

Mary went to him, laying her gold-tanned hand on his mahogany wrist. "Come on, Sayji. Don't tease us. What have you learned?"

He set down his drink. "I have learned that chemical control, in the sense of some compound that will do all our work for us, is not within our grasp now. There is something stirring in the back of my mind, you understand, but it's not even to the writing-down stage, not even to playing with the mathematics of the cell.

"Chemical this is, yes; but—I am almost ashamed to say it—very American, very European. Not at all the sort of life-oriented chemistry you have a right to expect from me, dear ones. Here it is." He dropped a handful of small plastic shapes and a larger one, something

like a baker's pastry tube, on the cocktail table that had been carved from a whole tree. The white plastic shapes lay in an ugly sort of pattern on the dark wood of the table.

Charles was the first to comprehend. All three thought through the tequila, at first, that the loop shapes were significant; and while they were handling them and realizing it was the same old collection of toroids and helixes that were supposed to inhibit human conception, Charles suddenly picked up the icing tube shape and began to work it, with a sheepish grin.

"By God, I thought of this once but gave up too soon. It's an applicator, isn't it? You don't need a doctor to make the implant."

"Yes," said Subchundrum, "so what?"

"Oh," said Yacov. "It's foolproof, is it?"

"Is anything?"

Mary said, "Well, Sayji, is it or isn't it?"

"Foolproof? Oh yes, it's *fool* proof. But, of course, it isn't fools we have to deal with."

Charles broke in. "It works, though? The woman can put the loop in place and remove it without the necessity of a doctor's or a midwife's helping her? Sayji, this is the breakthrough of the age. Every teenage girl in the world will want one as soon as she hears about it."

Subchundrum laughed in the way they had come to know meant he was embarrassed. "Yes, of course—*when* she hears about it and can afford the few pennies or her government can afford the few pennies or—"

"Or what?" Charles was ready to start the manufacture of the applicators at once.

"Oh, I only mean that we still face the problem of making these teenage girls—real teenage girls in villages and cities where the teenagers are not like the ones in your middle-class American head, Charlie—want *not* to be mothers. Women want a child, or two

or three children. They just don't want too many, that's all. But what number becomes too many? If you have three, four are just as easy to care for. And if child-bearing and child-rearing are really the only honorable courses open in life to a girl child, why should she practice this trick? What's in it for her as a person, not just as a point on a statistical curve?"

"Well, education—"

"Mary, Mary!" Subchundrum whirled on her. "What about yourself? You've stretched adolescence as far as even an American girl can. Well, Doctor Braden, isn't there something else you want from life? How long will you resist your deepest desires?"

Mary sat down with great deliberation. Charles and Yacov looked at her quietly and speculatively. She set her glass down on the tiled floor and then fixed Subchundrum with a direct and unsmiling stare. "Sayji, is this a proposal? What about the girl in Kerala?"

"Call it a proposition, if you like. I am as cool as you."

"Are you just demonstrating something?"

"Perhaps I am. But you will have to find out what it is that I am demonstrating."

The evening was ruined and the discussion died. Dr. Subchundrum's enthusiasm, which had assembled them all again, had curdled in the heat of his own doubts about the device, and in something Mary's presence had called out of him, something so far from the control that had marked him in their student years that Yacov and Charles could only shake their heads as they drove back to Mexico City.

Mary remained. Neither she nor Subchundrum ever told the other two whether she was there for days or for months. No child came of it; but as for the new device, Sayji's doubts proved well-founded. It was one

more weapon. It was a long way from being *the* weapon.

A year or two passed. Mary's postcards bore a Boston postmark. Subchundrum had been working in a laboratory in Holland. They were all in New York at a conference and evening found them in Yankele's suite with their shoes off and drinks in hand. Yacov was spending government money that year, and declared that his motto was, *Live a little.* He waved a glass to take in the opulent suite and all it implied.

There was a fifth wheel, a physicist who had been in school with them, blown into their group that night by a chance wind. He had a wry, studious sort of humor, so they had kept him with them after dinner, made him attend a seminar with them, and now they were all talking about anything and everything in the world except their consuming interest, of which they were all heartily sick for the moment.

The physicist commented on that. "Whatever happened to all those dirty stories the four of you used to tell?"

"Dirty stories?" asked Mary in her direct way.

"Well, all that talk about genitalia and the economy of the uterus would have been dirty stories in any other gang I ever hung out with."

Mary lounged back against Charles' shoulder and he snorted. "That's the thanks we get for trying to keep this cluck from being up to his hip pockets in human embryos. Trailbreakers are never understood."

"Ahh," said the physicist, "you're not trailbreakers. You *talk* dirty, but you're afraid to face up to the only radical solution possible now. Several of the most populous nations on the face of the earth need to take a twenty-five or thirty-year vacation from having any children at all."

"That's a solution?" Yacov asked lazily. "That ain't

even a statement of the problem."

"Sure it's a solution. All the children born for the next ten years in India, China, Indonesia, Mexico, Southern Italy, the Balkans and the whole Mediterranean shore have got to be sterilized at birth."

The collective howl was the payoff he had been playing for. The physicist chuckled, wiping Yankele's drink off his shirt, even as Yankele continued to shout.

He said, "But isn't that really what you ought to be working for? Isn't that what you want? It's certainly what I want. I'm willing to have it start in my generation."

"You've got two children, you goddamned white genocidist!" Charles cried.

"Okay, okay, don't get hot. Sterilize my two kids. I don't think much of my genetic inheritance. Hell, I haven't even got a Nobel and I'm looking forty in the teeth. Sterilize all my neighbor's kids, too. I'm generous. And I'm really a hell of a lot more altruistic than you fakes. This would solve the problem? You're just working to make it only a *little* worse each year."

Subchundrum grinned like a tubby shark. "All right, I'm not angry. I think you're right. I'm a member of the Cabinet in New Delhi. Now, Mr. Prime Minister, after you have given me *carte blanche* to put this solution into effect, give me also the political campaign which will make it acceptable to my people from Kashmir to Kerala. Just give me a formula that will keep us from being toppled from office before we carry out ten years of emasculations and hysterectomies on newborn babies. I'm listening, really I am."

The physicist said, with interest, "Subchundrum, are you really in the cabinet?"

"No, you idiot. I'm working in Holland. I haven't been home in so long I have no idea what the politics are now. I'm posing you a hypothetical situation. Now give

me the answer—because there has to be an answer. If you can't give it to me, then don't make easy solutions. Go get the eight-fold way back down to one-fold and leave us alone with our clumsy human problems."

"Oh hell, Patasayjit, I'm like the owl that told the arthritic centipede to change himself into a mouse so he'd have only one twenty-fifth as much pain. I don't know how you're going to do it. I function only on the policy-making level. The tactics and the hardware are up to you."

They all agreed, after he left, that he was disgusting. Now, years later, could they honestly say that line of thought had not influenced them?

They turned over another couple of pictures—failures that had brought them down the road to this desperate success. The morning-after pill, which a turn of Mary's research into hormone control had made infallible, had faltered on the basic shortcoming of all plans that required voluntary use of the inhibiting agent. Human beings found ways to forget, reasons to forget—even many a comfortable American husband, confident that his wife was taking the infallible barrier to conception, suddenly found himself a father.

In the poor countries the researchers were defeated over and over by the bedrock fact that children are wealth in a culture of poverty. Not only children starve in a famine—old people who have no children to fall back on starve as well. Fear and love and the genetic memory of a time when man was a naked minority among mammals all combined to edge the total number of human beings in the world over four billion, toward five billion, six billion, toward cannibalism.

Yacov led them through the last illusion: vaccination.

It was simply impossible to make people want anti-birth vaccination, just as it had been impossible to make people want the twenty-year time pill another brilliant

group of researchers had thought was the answer. The twenty-year time pill was at least measurable. Taken at 18, it opened the door to parenthood at 38; but it never became a popular arrow in the quiver of attacks on human fecundity.

Vaccination, the process by which a woman was made immune to male sperm, or a man immune to his own sperm so that he ceased to produce a viable seed, had all the residual irrational human opposition to vaccination to overcome, as well as one quality which made it hard for propagandists to push it. The vaccine's effect was variable. For some people it was lifetime immunization. For others it was extremely short-lived —and the duration proved to be unpredictable.

But the exchange of ideas and research among the four old friends on the relatively unproductive subject of vaccination led Subchundrum at last to the greatest discover of their lives.

The turn came when he sent word to Mary, Charles and Yacov. "Come to Keralal" Subchundrum wrote. "I have the money from my government, a free hand to build the labs I want and, best of all, I have the approach!" Two pages of cell mathematics followed. The mathematics were what drew them.

"All wrong, darling," said Mary as she stepped off the plane, "but so provocative!"

III

The machines that were to change the four investigators from passive inhibitors of the birth process to active interveners in that process were already fixed in the main laboratory. Two massive micro-manipulators had been modified to perform chromosome surgery.

Charles gaped and then smiled. "These let us get right to the innards of the cell, hey? I suppose you can

even repair LSD chromosome breakage with this, right?"

Subchundrum seemed to have gotten younger, to have regained the calm confidence of their undergraduate days. He had certainly become thinner again. "We can work even on virus mechanics with these things and that is where we shall be working."

Mary smiled and shook her head. "Dr. Subchundrum, you have flipped your autoclave. The steam has all escaped. The differences between human cells and viruses are so great that if we elucidated all the knowledge there will ever be about viruses—a hundred years' work, say—we would still not be much closer to solving our problem of humanely keeping down human populations."

Charles kicked a lab table with a dirty sneaker. "That's right, Sayji; or at least, it seems to me right. Have you discovered some affinity between viral structure and human cell structure hidden from the rest of us?"

Yacov smacked Charles mightily on the shoulder. "None so blind as cannot see, eh, Subchundrum? I see it because I was the responsible executive on the vaccination project. The affinity between human cell and virus is that viruses like to live inside human cells."

Charles rubbed his upper arm. "Sure, but those are diseases. We don't want to infect the whole human race with some plague."

"Don't we?" asked Mary. "Don't we? Why not? I see, Sayji; you've built on the work of the researchers who have used viruses to create a *beneficial* infection."

"Beneficial!" cried Charles. "What illness is beneficial?"

"My dear, many a woman has welcomed a week of flu. For the price of a little fever and nausea she can drop ten pounds at a fraction of the price and effort it would take in a salon."

Yacov picked it up. "More to the point, Stanfield

Rogers and his followers have already demonstrated that a virus deadly to one animal—Peyton Rous' chicken sarcoma virus, for instance—is just a harmless passenger in man. Rogers showed that the Shope virus, which makes cancerous tumors in rabbits, suffers a benign conversion in man's bloodstream, where it elaborates a special form of the common enzyme, arginase. Haven't you read some of his work?"

"Sure," Charlie said musingly. "The bacteriophage, the virus that eats bacteria, is itself the agent of the toxin in diphtheria. Only those diphtheria bacilli which have inherited a particular strain of bacteriophage make the deadly toxin. Other strains are nearly harmless. I knew that."

Mary spoke. "And somebody, I forget who, has been looking for a virus that would be silent as to disease but would manufacture the missing enzyme that will let retarded children be like normal ones." She snapped her fingers. "Who's doing that, Subchundrum?"

"Never mind," Yacov broke in, "It doesn't matter. The point is we can start with a viral disease which often does cause sterility and modify it to produce the sterility without the sickness. Wait a minute, though, Sayji, how are you going to get people to hold still for inoculations when they won't accept vaccination and the twenty-year time pill?"

"Ah, you have missed the important point. The lesser aspect first: we don't need inoculation to circulate a virus, once it's implanted. The practical effect of Salk showed that. After an extended period of administration of the Salk vaccine, supplemented later by the Sabin preparations, a new child who moves into the area of Salk protection catches the immunizing virus from the other kids instead of the crippling, sometimes fatal wild strain of poliomyelitis. And of course, nobody ever has to be inoculated to catch flu or polio. The viru-

lent strain of the nineteen-eighteen influenza spread itself—and eventually died out itself, squeezed for existence by the sickening but infrequently fatal strains we have to deal with every winter."

"All right. The lesser aspect is pretty good. Now tell me number two."

"It's really a corollary or extension of number one, but it means the breakthrough that finally lets our work become meaningful. We don't need anyone's voluntary consent to put this into effect."

"What?" cried Charles. "How the hell do you get 'em to take it if you don't have consent?"

Mary said, "Dear idiot, you haven't been listening to sweet old Subchundrum. He proposes to infect the whole human race. Sayji, love, Hitler was a piker to you. How do you propose to reverse this mass castration? I still haven't had *my* child, you know. I'm interested."

Patasayjit Subchundrum smiled and waved his hand at the functionally beautiful micro-manipulators. "To the machines, children. What we have to construct is a virus that is obedient to some kind of command. I don't know the answer. But now—and frankly for the first time—I know there is an answer. This cannot be a dead end, as so much of work has been. We cannot stop with a virus that produces sterility—nor with one that might ultimately destroy the human gene pool."

"Right," said Mary. "It's somebody in Roger's group who's working on the mental retardation enzyme. Some of the children who fit the classification of retarded are so because they have a genetic disease, phenylketonuria. Their bodies don't elaborate phenylalanine hydroxylase, which the brain needs for normal function. The virus gardeners are trying to breed a mutation which will be a silent virus otherwise but will produce the missing enzyme."

"Exactly," said Subchundrum. "I do not propose to wait for mutations induced by cosmic rays or even by plasmas. I propose that we rework the genetic codes of some virus to make it remember a bias against human birth; and at the same time, to leave it subject to easy defeat when we get ready to license a birth from a particular man and woman."

"First the infection and then the examination of the whole human race to determine who shall breed?" Charles asked. "That's rather godlike, isn't it?"

Sayji answered with a twinkle. "Hindu gods can do all. They are not dead and they are not in Argentina either. Come, come, to work!"

With some misgivings, they all set to work. Dr. Subchundrum was bothered more than he cared to admit by the ethical implications of the research. As long as success was not quite within their grasp, however, he could put off the final accounting which would bring him to the decision of whether and when to unleash an anti-birth infection upon the world.

Mary Braden and Subchundrum were the genetic surgeons of the team. They had a delicacy of manipulative behavior in their hands and eyes that was lacking in those of Charles Perry and Yacov HarShawkor. It fell to Yankele and Charlie to do the mathematics and program the computer analogues which screened the manipulated viruses, and to handle the breeding experiments that tested the few altered viruses the computers found promising.

What all had expected to be the big hurdle was cleared within months. It proved to be almost easy to create a virus that colonized male testes and killed each sperm as it grew. What seemed to be impossible to accomplish was to make the virus itself viable.

A virus could be defined as a cell stripped of nonessentials: a hippie cell, Mary had said. There still was

a nucleus, so to speak, but the organism had deprived itself of all those attributes which ordinarily go to independent functioning. Viruses could reproduce themselves and live within host cells. During most of their life cycles they depended on the cell wall of the host for protection—and it was only if the cell wall collapsed because the cell had died, or the virus had killed it—that a virus needed to wrap its essential components—its genetic ability to reproduce—in some sort of film for the migration to another cell.

The mutated, rebuilt viruses Doctors Braden and Subchundrum found it easy to turn out lacked one essential feature of self-protection. Instead of being parasitic, able to live off a host, kill it and drift in a little inner spaceship to another and enter it, they were symbiotic. Living within the sperm, they throve. When that life killed the sperm, the squatter virus died with it.

Dependent to the end.

The problem was one they did not seem able to solve. "No exit," Charlie snarled one night at dinner. "We're going to be right here—footling around with submicroscopic particles of memory chains—when the solid wave of humanity breaks over those mountains and rolls us into the Indian sea. There isn't any answer—only the problem. Krishna or Vishnu meant the human race to end in race suicide. Dinosaurs died. Dodos died. A million years from now, there'll be some tiny bipeds hiding under leaves, left over from our age the way iguanas are left over from the reptilian. Damn!"

No one could oppose him, except with faith. "Faith!" he spat. "Faith in the scientific process? Like those poor devils with the ear troubles from monitoring static from the stars? Pfui!"

Nevertheless, they continued to work, without much apparent enthusiasm but the dogged care of profes-

sionals. Even Charles was patiently methodical about his computer programs and methodically cursed lab assistants who let sperm cultures die of neglect or, finding one dead, threw it out without trying to understand how it had been killed.

It was Subchundrum who realized at last the essential natural element they were leaving out of the ecology they were trying to construct for their mutated virus.

"Most diseases we think of as virus diseases," he said to the others one gray morning when he had woken with a headache and an idea that vanquished his headache, "are not transmitted directly from one person to another. They are *vectored.*"

"Yes," Mary said. "An insect or another animal serves as a conduit. Rocky Mountain spotted fever is carried from a sick individual to a well one by a mite. Typhus is vectored through lice."

Charles spoke. "For some viruses the movement through a carrier is an essential part of the life cycle. Maybe that's true for our little old sperm-killer. Let's start the testing with fleas. They're easy enough to find."

So the search began. It was wide-ranging, in depth, relentless—and unsuccessful. Fleas of every variety were tried and found wanting. Mites rejected the virus as if it were an inert protein particle. The blood of rodents destroyed it. To birds it was a quickly dissipated intoxicant. No animal could be found to transmit the tiny killers back into man's bloodstream in effective form.

A vigorous attempt was made to render the virus pneumonic, so that it could be allied to influenza and transmitted rapidly by sneezing, coughing and kissing. The virus particles simply fell out in such passage. Nothing revealed the artificial nature of Subchundrum's virus more than this: it could only be made effective by

inoculation. The anti-birth virus seemed for a long time to be just another dead end.

The project lost its *élan.* Workers began to leave for glamorous projects elsewhere with more pleasant surroundings and better prospects. Many went to other silent virus programs that were trying to eliminate mongoloidism, premature births and childhood leukemia.

"It's not bad enough," said Yacov, "that they leave us. In a sense, they go over to the enemy."

Mary finally made the suggestion that became the core of the team's last joint operation. She was no longer diffident, as she had been when they first met; but this suggestion was timidly put forward one Saturday afternoon when they were brainstorming the problem.

"Fellow doctors, perhaps we have been approaching the question of a vector for the virus in a manner too restricted to allow the answer to be seen. We have been thinking of transmission from man to man via some other species."

Subchundrum said, "That's the way all vectored viruses work. Man-mite-man; man-flea-rat-flea-man; man-mosquito-man. What are you getting at?"

Mary patted the back of her hair. "Just that man as a species isn't all male. *Woman* is also man. We've concentrated on male species-X-male, forgetting that many diseases, particularly genetic ones, pass man-woman-man. Maybe that's the natural passage we've been seeking for Subchundrum's virus."

Mary spoke on a Saturday afternoon; but neither holidays nor weekends on a regular basis were recognized in Subchundrum's biological laboratory. Within an hour all four scientists were at work. Within a week, the vortex of their activity pulled in the rest of the project personnel.

First Subchundrum and Braden had to structure the

inheritance pattern of the virus to affect the mice who were the starting point of their experiments in vivo. The computer work and the breeding experiments had to follow. Then the living particles had to be modified to repeat their sterilizing migrations in the monkey colony; and last, the great step of infecting human beings had to be undertaken.

At that moment, Yacov had been compelled to leave for a week's conference in New Delhi, not to reveal what Subchundrum's project was doing, but to see what he could find out of any other project that might aid the virus research. He learned nothing, except that the great thrust of research was still to find *the* method which should be so simple, so cheap and so foolproof that earth's breeding billions would overnight adopt it. The ethical, religious, emotional and economic blocks that might keep even such a remedy from being adopted were still being dealt with on the slow, agonizing basis of education and propaganda.

Yacov HarShawkor had taken the plane out of New Delhi in a mixture of depression and excited anticipation. He was depressed because there had been no hint that other groups were aiming in the same direction as Subchundrum's. He was excited because he hoped his colleagues had succeeded. Yacov knew that great discoveries in this day and time took place almost in parallel because of the instant exchange of ideas in the scientific community and the immense sums available to research. Like war, research had become a stable and calculable contributor to the gross national product of many countries.

But, he thought, *we* haven't published. Maybe others also have failed to publish. One hated to fail in a grandiose design. And yet, no one could be really comfortable about a remedy that stepped over the line

from persuasion and voluntary use to compulsion and involuntary infection.

Ah, well, I'll get a nap and when I get back to the lab compound Sayji and Charlie will shrug and tell me this line didn't work, either. We'll let the governments face the ethical problem when we have the gun in our hands.

He had walked off the plane into the nightmare of hunting down Mary Braden. Now Subchundrum and Perry were explaining to him the imponderable and unpredictable way in which the last experiment had exceeded the level of success.

"It's enough," Perry said, "to make a man believe in a directed universe. Since we decided a human female would be the vector we've hardly done anything that missed. Every step of the work has gone like greased lightning."

"Why not?" asked Subchundrum. "We have become experts."

"Yes," said Charles, "but it's all been better than expert. I'm remembering what Hoogie used to say: 'This world does not tolerate the dominance of one animal at the level man has reached.' I tell you, it seems as if some great principle has pushed us on; and having Mary, or the focus of infection Mary became, loose on the world would have brought the human race to an effective end in this generation. I mourn Mary; but thank God we killed that carrier of the virus. Now we've got to start in and rework it."

Subchundrum spoke. "It was that errant fireball."

"What?" said Yacov. "Talk sense. Speak paragraphs. Remember you're trying to teach me something. Attack it in an organized way, will you?"

"Well, you know there's a station about twenty miles away, up in the foothills, where they are doing plasma

research. Those fellows don't say, but I think they're trying to make a genie for war—some way of binding a plasma with its hard radiation in a brass bottle you could unplug in an enemy's face or in his factory. They're up there where they can tap the hydro-electric plants for all the power they need; and they're using it by the megawatt."

"So?"

"So last week, right after you left, they lost a fireball. A great globe of lightning wandered around here all night flickering, looking in windows, perching on roof-trees, playing tag with us all over the place.

"We were all ready to go with a batch of virus the three of us had vetted. Mary and I had decided—and we persuaded Charles—that the three of us should test the vector pattern. We thought some of the hard radiation that lightning ball hurled off might have got at my deadly babies. After all, in glass they're as vulnerable as fish in a barrel."

"What did you do?"

"All three of us, Yacov—all three of us—went over the batch with the electron microscope. I swear none of us saw a genetic stutter in the bunch. We were still wrong to use that culture. I've incinerated the rest of the batch in an electric crucible."

"Right, Sayji. That's what you should have done in the first place. In a culture of billions, examination of a few thousand left a whacking great statistical possibility that you wouldn't see a major mutation."

"Yankele, we were all in a fever. That's the truth. Mary cast her vote yes, too."

"Fever is right—you killed my girl with it."

Charles spoke up, soberly. "Yacov, she was your girl for this month, maybe last year. You know better than to think it would have lasted forever. We've all been Mary's 'one man' many times. She loved us all and

we all loved her and the time has gone by when any of us could be jealous of her favors. Sayji and I killed her, sure; so did that fireball, so did she and so did you."

"All right, leave it! What happened?"

Charles spread his hands. "It worked, that's what happened. We've got the answer in our hands, as soon as we can attenuate the effect of the virus on the female vector. *That* effect was a wild, unpredictable thing that we've got to control. Sayji and I are as sterile as two eunuchs; but it killed Mary."

"How?"

Subchundrum spoke. "The first leg of the vectoring as accomplished between Mary and me under proper laboratory conditions of sanitation and observation. Then we gave it forty-eight hours for the virus to multiply in her bloodstream, before she effected the transfer to Charlie."

"And then? Was she healthy up to that point?"

"Absolutely. Temperature, pulse, respiration, blood count, odor, urine, all just the old Mary we knew. You tell him what happened next, Charlie."

"We left the lab room where we had been, with all the instruments for recording the conditions under which the transfer took place. I walked her to her quarters. I went on to mine, took a shower and dressed. In about twenty minutes from the time we left the lab she phoned me. 'Come over here,' she said.

"When I walked in she was still wearing the robe in which she had left the lab. Yacov, she just took it off and came at me. I thought—for about half a minute—of whether this could affect the experiment and then forgot it. When we finished I put on my pants and shirt and laughed. 'Okay, Mary,' I said, 'now I have to shower again and get back to work. I'll see you at lunch.' All I had noticed was an increase in temperature. She was like an oven, but I thought—oh, well,

you know. Fiften minutes later she was out on the compound."

"Nymphomania?"

"Something more," said Subchundrum. "Something elemental, Yacov. She was like a tornado. I don't suppose there's a man on the station she didn't sterilize. We had to sedate her and feed her intravenously. And tonight she evaded us anyway."

Yacov stood. "We have to finish this now. We've got to find the cure—or the method of attenuation of the virus. We've got to protect the women in the villages around us from the men who work here. I'll stick to the end; but I don't want either of you to say a word to me that isn't business; and when it's over, I don't ever want to see or hear either of you again," he turned and strode out.

It was four days later, just as they readied a new strain that news of the outbreaks reached them from the villages five and ten miles away; two days later the first epidemic reports from New Delhi; and ten days later the postcard came airmail from New York.

As Yacov read it tears started from his eyes; but whether they were tears of relief, of love or of fear, he could not have told. In familiar handwriting, the postcard's message was:

"Flesh wound in shoulder healing nicely. Ecological balance is not denied. Wish you were here. Mary."

BRUNNER'S WORLD

No man can be all bad who, at the age of 16, informed his headmaster that he was leaving school because it had begun to interfere with his education. John Brunner is in fact such a man, and what he in fact is is very good. As a writer he has been developing

force in the field of science fiction since the early 1950s; his big novel of a couple of seasons ago, *Stand on Zanzibar,* was so big that the Modern Language Association devoted the whole of its annual science-fiction symposium to that single novel. No other book has ever been so honored.

Brunner writes with many voices. His early work is straight sf adventure, so good of its kind that only the most depraved addict of elegant prose would welcome the transition to more sophisticated work. But if he had not made that transition, he would not have novels like *Zanzibar,* or short stories like *The Totally Rich . . .* or the one which follows.

THE EASY WAY OUT
by John Brunner

No human being had any right to survive the crash of the *Pennyroyal:* tumbling insanely out of space through air that bit blazing chunks from its hull, down a thirty-mile sandslope sown with rocks, and ultimately wrong end first into a vast dune which absorbed it like a bullet ricocheting into the bank around a rifle range.

By a minor miracle the sand put out the fires on board. There had been a lot of those.

After that nothing happened for a long time.

I'm alive.

The thought floated sluggishly into Pavel Williamson's mind. He hated it. He was half-buried in something dense and yielding, and he was almost suffocated by choking fumes. Moreover he had been tumbled around and around in total blackness until he was sick with giddiness. His head ached foully, there was a taste of blood in his mouth, he seemed to be one vast bruise

from the waist down, and there was a sharp pain in his right ankle.

Taken by themselves, those minor injuries were not sufficient reason for preferring not to be alive. But there was another, more important reason. As the ship's medical officer, not concerned with matters of navigation, he had no precise idea where the *Pennyroyal* had been when a vast explosion shook it like a hammer blow, but he was absolutely certain that the planet they had crashed on was not the one they were bound for, a safe Earth-type world.

Therefore these fumes which were swirling about him might all too easily not be fumes at all, but the planet's unbreathable atmosphere. In which case the best—the only—sane course open to him was to compose himself and wait for merciful extinction.

He was not a professional spaceman, just a young doctor who had signed on with a succession of spacelines in order to see a little of the inhabited galaxy before settling down on a world which suited him, but he had been impressed by the autohypnotic formulae some spacemen used in emergencies like this one. Closing his eyes—not that they had shown him anything when they were open, because it was absolutely dark in here—he began to recite one in his head.

And stopped.

A banging noise!

Some part of the wreckage settling? Something falling on a resonant steel floor? Most likely—

But it wasn't! He jerked, and cursed his injured ankle which responded with another arrow of pain. No, the bangs had been too regular—and there they came again: one-two-three, pause, one-two-three, pause. Like a man hitting a bulkhead with a fist, or some hard object.

It dawned on him that someone else must be alive

nearby, and that if someone else had survived the crash, it might not have been as bad as he'd assumed, and together he and some helpers might rig some sort of beacon to help a search party locate the wreck.

And if the fumes were fumes, not bad air, then they might have come down on—

He fumbled frantically among the mass of soft stuff he was almost over ears in, wondering what it was, and recognized it in moments. Furs! He'd known the *Pennyroyal* had a cargo of furs on board—it had been part of his duties when they were loaded to check them for parasites and disease germs—and he had seen them being stowed in a compartment adjacent to his surgery. Fur traders often paid the extra cost of shipping their wares on a liner instead of a freighter; now and then, a sale to one of the wealthier passengers not only wiped out the difference in charges but actually made a profit. Presumably the reason they were out of their bales was that they'd been on display when the explosion occurred. And he himself—he worked it out because the pattern of his bruises matched the theory—had been hurled through a weak spot in the bulkhead, flimsy to conserve weight, and landed against a wad of them thick enough to save his life.

Floundering, almost swimming, he began to force himself to the surface of the pile, and realized as he did so that his weight felt only a trifle less than Earth-normal. His spirits rose. The air around might then be breathable after all. The system they had been bound for was among the rare ones which boasted two oxygen-high planets: their destination, Carteret, and another which had not been colonized. This was the fringe of human space, and the original impulse which had carried the species so far so fast was waning. Conquering a brand-new world when there was another next door considerably warmer and more hospitable

was not an attractive proposition.

In any case, "oxygen-high" was only a comparative term. If his guess were right, and they were on the next planet out from Carteret, the air would be of poor quality because the vegetation from the sea had as yet barely begun to invade the land; most of it was desert, either sandy or rocky and in both cases chilly. The shoreline plants put about two-thirds of Earth-normal oxygen into the air, and they were mutating rapidly and extending their terrain, so in a million years or so one could look forward to a marked improvement.

Hah!

For the time being, though, what counted was that conditions could be endured, if not enjoyed, on Quasimodo IV. He reminded himself that he must take things easy as he fought his way out of the furs—he couldn't recall offhand what the CO_2 count was in the air here, but he knew it was dangerously high. Indeed, the throbbing ache in his head was probably due to it rather than to the blow which had cut his eyebrow and sent a trail of blood down to the corner of his mouth.

Something hard and cool met his probing right hand. He recognized the shape: one of his medical instruments, a lung inspector. And next to it—

He withdrew his hand with an oath. Something wet and soft. He preferred not to wonder about what it had been before the crash, and was glad of the darkness.

The triple banging came again, but weaker. There would be time enough to search for his equipment later, he decided, and continued his attempts to work free of the furs.

When eventually he found solid footing, he groped his way across a tilted floor, located what he had

suspected—a rip in the bulkhead—and slithered through it, snagging his shirt on a projecting spike of hard plastic. Beyond, there was light. Not much, just a pale wash of daylight leaking through a gash in the hull, very yellow to his dark-adjusted vision. But it was daylight, and this was natural air he was breathing, contaminated with smoke from the crash, and there was gritty sand under his feet, all of which went to confirm his guess about arriving on Quasimodo IV.

He would have felt almost cheerful but that by this dim reflected sunlight he was able to see the ruin of his surgery. Everything had been spilled out from every cupboard, every drawer, every shelf, and he had to push confused piles of medical phials and instruments out of the way with his toes to find a path across the room. In two places the wall had split open, revealing the electronic veins and arteries of the ship, and something was dripping loudly somewhere.

But he would have to leave a proper investigation of the mess until he had located the other survivors.

Brackets around that plural "s."

It was like walking into nightmare to turn along the crumpled corridor in the direction of the noise he'd heard. Everything was distorted, and although the little light which guided him came in only through cracks in the hull there were all too many such cracks and he saw more detail than he would have liked. At the extreme end of the passageway, in particular, there was something which looked loathsomely half-human, as though one were to make a doll from overripe bananas and hurl it at a wall: *splat!* Even as a trained medical man, he didn't as yet feel up to facing it.

Now he located the noise. It was coming from one of the nearest first-class passenger cabins, the door of which was stiff but still moving in its grooves. He slid

it aside and found a young man lying in a bunk which had torn completely loose from its mountings. He had something in his limp hand, the object he had used to bang on the wall, Pavel presumed, but it appeared that while he was opening the door the man's strength had failed him, for he now lay still.

His heart sank. Of all the people aboard, he would have chosen this man last to be his companion after the crash: Andrew Solichuk, who had never tired of informing anyone and everyone how wealthy and influential his family was back on Earth and had complained endlessly about the food, the lack of comfort and amenities, the taste of the air, and the company he had to endure simply because he was on a grand tour of the commercial empire he was due to inherit and there was no luxury line serving the Quasimodo system, only the *Pennyroyal* and her sister ship the *Elecampane*.

But he was human, and alive. Pavel forced his professional reflexes to take over. He called Andrew's name, and elicited no reaction, the man appeared to have fainted. He checked his pulse and found it weak, but not failing; also his breathing was tolerably even. But when he pulled back the coverlet of the bunk he saw why Andrew had passed out. At the very least he must have suffered a compound fracture of the lower spine; quite probably he also had a broken pelvis, and there must certainly be internal injuries.

There was no trace of blood at his mouth, which indicated—though it did not prove—that his lungs were intact. But his left shoulder was dislocated, and there was a cut on his scalp which had soaked his pillow with blood.

Trivia like that he could take care of with water, any sterile dressing he could find in an untorn package, and his own strength. Otherwise, though, there was literally

nothing he could do except make Andrew comfortable until help arrived. Taking a spine to bits and rebuilding it was a job for a modern hospital, and he half-doubted whether even the facilities on Carteret would be up to the task.

Since Andrew was currently unconscious, the best thing to do for the moment was to leave him that way while he determined whether any other survivors had lived through the crash, and sorted through the mess in his surgery to salvage what he could.

He crept very softly back into the corridor.

It took him only a few minutes to become convinced that there was no hope of any other survivor. On top of his other irritating habits, Andrew was ostentatiously "liberated from the tyranny of clocks." He invariably slept until late in the ship's artificial day, fourteen or fifteen hours, and then made merry until the small hours regardless of the people he inconvenienced, whether by his loud drunken laughter, his insistence on playing music at maximum volume, or the stamping dances he had learned on some planet or other earlier in his trip. In particular Hans the ship's steward hated him, because he felt the was entitled to human service despite the perfectly good automatics everyone else relied on, and during most of the voyage had kept Hans dancing attendance on him for so much of the "night" the poor man had to make do with three or four hours' sleep.

And it was this which had saved Andrew's miserable life. Everybody else had been up and about in the after part of the ship, and that was full of sand, poured in by the ton when the hull broke apart. There wasn't a chance in a million of recovering someone alive from that mass of grit and gravel. It was going to be tough unearthing from it food, water, and other essentials for their survival. Pavel suspected he might have to tear

loose a hull-plate to use as a shovel.

It was a gloomy consolation that his guess about their location was being proved correct at every step he took. Despite the ache in his head, which was now growing almost intolerable, and the leaden heaviness of his limbs, when he had completed his survey of the reachable areas of the ship he postponed his return to the surgery for the sake of scrambling up one of the heaps of whitish sand and grit beside the cracks in the hull and peered out, having to steady himself by clinging tightly to the edges of the hole because the footing he had was so precarious.

Overhead, the sky was a uniform dark blue, close to indigo. The sun, slanting low in the sky, was small and very yellow. The air was cool, though not cold; perhaps the high proportion of unreduced CO_2 in it was enhancing the greenhouse effect and producing a disproportionately high daytime temperature. But on the other hand it was dry and harsh in his throat. They must be a long way from open water.

With a supreme effort he hoisted himself up far enough to look over the scarred and battered hull-plates in the direction away from the sun, and instantly realised how it had come about that the ship had not simply been smashed to fragments. There was a vast furrow in the sandy plain, dotted with boulders, on that side, and the level of the ground seemed to slant slightly upward, though the strain of holding himself on his arms was blurring his vision and it was difficult to make out details. Nonetheless, the pattern fitted: the glancing angle at which the ship had struck the ground must have been parallel to the slope, and instead of stopping dead (he wished he hadn't thought of that metaphor) it had gone skidding and grinding onwards for mile after mile. Until it had shed its initial velocity and piled into the dune.

Well, it was comforting to know he could still think, reason, solve puzzles. He let himself drop back into the heap of sand and headed wearily for the surgery.

Quasimodo IV, he thought. *Perhaps I'm the first human to see it from ground level in a hundred years.*

But there was nothing in the least exciting about that.

Almost the first thing he came on in the surgery which was intact enough to be of any use was a box of stimulant injectors, one out of a stock of perhaps forty or fifty which had been crushed into glass-prickly ruin. He tried to decide whether it was wise to give himself a shot, found he couldn't make his mind up, and did so.

At once his head cleared, and an artificial clarity informed his thoughts. New energy came to him, and rediscovered appetite. But as yet he had not located any food, and he was sure that when he did it would be after long burrowing into the sand dune. He repressed all thought of eating with a violent act of will, and went on hunting vigorously through the tangle of instruments and the stocks of drugs.

Within half an hour he had assembled much more than he would have dared hope for: stimulants, depressants, systemic purifiers, tissue regenerants, ersatz nerves, assimilable skin, synthetic plasma, clotting agents, antallergens, immunosuppressants, and simple painkillers. Also there were several items of no obvious relevance, such as specifics for Watkins fever and lembrotal withdrawal symptoms.

And most of the instruments appeared intact. That, though, was only on the outside. Inside, they contained fantastically delicate webs of electronic circuitry; solid-state though it was, without the master checkboard to confirm their normal functioning, he had to suspect

that it might have been deranged by the crash. You didn't pick up a modern diagnostic device and throw it at the wall. If you only let it fall to the floor, you checked it out before re-using it.

And the checkboard had been filled with drifting sand. So even if—as he was half-thinking—he did contrive to jury-rig a power source, he wouldn't be able to rely on it.

Forget the instruments, then, except the most ancient of all, like limb-tractors and scalpels. For thousands of years doctors had had to depend on the data they could carry in their own heads, and by modern standards his mind was well-stocked because he had always been blessed with an atavistically good memory. Just as the invention of writing put paid to the blind bards who could recite ten thousand lines of Homer without prompting, and the invention of computers put paid to the mathematicians who could multiply ten-digit numbers in their heads, so the invention of diagnostic tools had discouraged the kind of doctor who could distinguish five hundred types of fever by simple inspection. But Pavel had taken a great interest, when he was a student, in the history of medicine, and he was confident that most of what he had learned was there in his mind, ready to be used—

Or was it? Was that a euphoric delusion due to the stimulant he'd injected into his arm?

He had no way of telling. He could only order himself to proceed very cautiously.

Right: he had a patient waiting, providing he hadn't died in the meantime. He selected what he thought would prove most helpful from the pile of drugs and instruments before him, and for want of anything better as a light source added a retinal examination torch, whose beam was no thicker than his finger even at maximum spread but was at least nice and bright.

And went back to Andrew's cabin.

As he put out his hand to slide the door back, he was struck by a terrifying premonition. During his search of the wreck, he had seen few actual corpses—apart from that disgustingly *squashed* body hurled against the end of the corridor—but he knew the rest of them must be there, under the near-mountain of sand which had collapsed on the hull.

Suppose while he was gone Andrew *had* died? He was hardly what you'd call a fit young man; he over-indulged in liquor, probably in drugs too, and certainly he overate. He was far too fat for his age, twenty-two or twenty-three.

If he had died, Pavel would be compelled to wait alone for a rescue party, with no one to talk to, even if the talking were no more than an exchange of insults . . . and no proof that he *was* going to be rescued.

Until this moment, he'd taken rescue for granted. He'd been aware that they had dropped out of sub-space almost an hour before the explosion, leaving as usual plenty of margin, because emerging from sub-space close to a sun was dangerous and an old ship like the *Pennyroyal* had to allow some one and a half to two AU when entering a system like this.

This voyage from Halys to Carteret was a routine affair a milk run, as the ancient argot termed it. Nonetheless, even if Captain Magnusson didn't keep what you would call a tight ship, he would presumably have signaled ahead to tell the port controller on Carteret that they were in real space again. . . .

Presumably.

Pavel felt abruptly ill. No, he was being too kind to the captain—*nil mortuis*. Putting it bluntly, Magnusson had run a sloppy ship, the worst of the dozen or so Pavel had signed aboard. The chances were that the explosion which had wrecked the *Pennyroyal* had

been due to neglect of some official safety-precaution. And there was a risk, small but not to be ignored, that Magnusson might have thought signaling ahead to their destination was superfluous.

In which case there might be a long wait before him. A *very* long wait! And if he had to face it on his own—could he stand the strain?

He slammed back the cabin door violently to wipe out the picture which had arisen in his head: the sight of himself, face in the rictus of Hippocrates, surrounded by the empty drug phials he had retrieved from the surgery.

At once a whining voice came to his ears, and he was so relieved by that, he almost failed to pay attention to the words.

"You went away and left me!"

What?

He turned on the torch and approached the bunk. Andrew spoke again.

"You came in before—I heard you! You left me lying in this terrible pain! Damn you, damn you!"

Pavel was about to blurt an angry rejoinder, but he caught himself. Instead he said soothingly, "I went to get some drugs and instruments. You're in a bad way, Andrew."

"You went away and left me alone in the dark!" The voice would have become hysterically loud, but on the last breath it broke into a whimper, and then there were sobs, shrill and grating, like those of a spoiled child denied a piece of candy.

It should have been anyone but Andrew—anyone!

Maybe, though, this petulance was ascribable to his pain, which must be agonizing. That would be dealt with. Pavel selected an injector from the handful he had brought and placed it against Andrew's exposed right arm. A few seconds, and—

"Oh, it's you." As though time had been turned back, the voice had reverted to normal, complete with the sneer he'd learned to detest during their voyage. "The so-called doctor who can't even treat a simple headache!"

That was an allusion to their last encounter. Andrew had called for him—not come to his surgery, like the others—and insisted he had a migraine. Thorough, punctilious, Pavel had checked him out, and his instruments had confirmed what he had already started to suspect: the young man's complaint wasn't migraine at all, but a hangover which had lasted three days without an interlude which might have allowed the body's own defences to flush it away. And he'd said so, adding that Andrew was on the verge of alcoholic poisoning, and Andrew had roared that he was a liar and unfit to practice his profession. He had gone so far as to report Pavel to the captain . . . not that that made much impression. Captain Magnusson, fundamentally, resented the regulation which compelled him to have a medical officer on board at all, and would have been happier with mere machines, since they were cheaper.

Roughly, Pavel said, "You have something a lot worse than a headache."

Andrew's forehead creased. "Why are you shining that light at me? Why is it dark in here?"

"Why the hell do you think? We crashed, of course!"

"Crashed?" Andrew almost sat up—but Pavel put a heavy hand on his shoulder to prevent him.

"Lie still! You have a broken back and probably a broken pelvis, and all kinds of internal injuries. I gave you a painkiller, but if you want to live you absolutely must *not* move."

"What?" Fretfully; Andrew seemed not to have taken in what he'd been told. He made to lift the coverlet, and winced.

"Hell, that hurt! And you said you'd given me a painkiller! Can't you even use the right drug to . . ."

"Now you listen to me!" Pavel rasped. He was picking among the gear he had brought, looking for the collapsible limb-tractor. "You're about as badly broken as a man can be and still expect to survive. Have you got that?"

"I . . ."

Andrew's face crumpled like a wet paper mask as he realised: *this is happening to me!* He said, "We crashed?"

"Why the hell else do you imagine your bunk is on the wrong side of the cabin? What do you think threw all your belongings across the floor? If you hadn't been in your bunk, but up and about like everybody else, you'd be under a thousand tons of sand!"

"None of your needling! I live the way I choose to live, and if other people don't like it that's their bad luck!"

"Oh, shut up!" Pavel was assembling the limb-tractor now. "Make the most of the painkiller I gave you. There isn't much left, and the only other thing I can do to dull the pain you'd feel without it would be to give you a total block on the lower spinal cord—and I'm not sure it could be reversed. It might mean you being paralyzed. If you want to walk around again, a whole man, you listen to me and do as I say. Clear?"

The blurred oval of Andrew's half-open mouth trembled. He was getting through.

"All right! Now I'm going to have to fix your left arm. It's dislocated, but this will reseat the shoulder in its socket." He hefted the limb-tractor. "So brace yourself. You probably haven't suffered much pain in your life, but human beings used to put up with far worse than what you'll feel. Now if I can get around this bunk to the other side. . . ." Moving as he talked, he

found there was just enough room for him to stand.

"They also used to put up with head-lice and fleas and open sores!" Andrew snapped. "We've made progress since those days!"

Surprised to find that this spoiled young man had even heard of such things, Pavel lifted the desensitized arm and fitted the tractor around it, trying not to think about the nauseatingly wrong angle it made at the shoulder. He said, "There hasn't been much progress here. We seem to be on the next planet out from Carteret. It hasn't even evolved into the Pleistocene Age. Right, here we go!"

And he snapped the spring of the tractor, and the shoulder joint re-engaged with a thud. Perfect.

Detaching the device again, he heard Andrew saying, "Well, what about you, then?" The old acid burned in his tone, as though he were constitutionally incapable of talking to people without seeking ways of making them feel small. "Were you in your bunk too, like me?"

"No! I was thrown clear through the surgery bulkhead and into that compartment full of furs. By a miracle they were all out of their bales, and—"

"Well, hell!" Andrew crowed. "I saved your life!"

"What?" The next stage would be to cleanse and examine the injured man's lower body; Pavel was already selecting the gear he required for the job. He paused and glanced up.

"Saved your life," Andrew repeated with a harsh attempt at a laugh. "I was bored last night. I woke that man—what's his name? The one from the fur dealers?"

"You mean—what *was* his name?" Pavel said glacially. "He's dead."

"I didn't like him anyway," Andrew said. "But I woke him and told him to show off his goods. Made him take them all out of their packing. Well, I'll be damned!

If I hadn't done that, you'd have been—"

"Killed," Pavel broke in. "But *you* would have been dying here in terrible pain."

"The hell I would," Andrew said. "That's not my style. You should know that by now."

Worriedly, Pavel stared at him. One of the side-effects of the drug he'd used, in certain susceptible types, was a kind of megalomaniac euphoria. It appeared that Andrew must be susceptible.

"No. Look just to your right," Andrew went on. "See that black case?"

Pavel complied, and noticed a square dark case which he must narrowly have missed treading on when he went around the bunk to apply the limb-tractor. He picked it up. It was heavy for its size.

"There's a combination lock. Press five, two, five, one, four."

With the help of the torch, Pavel did as he was told, and the lid sprang back. His blood ran suddenly cold.

"Know what that is, do you?" Andrew said triumphantly.

"Yes." Pavel heard his voice as gritty as the wind blowing across the dunes outside. "I should have guessed that this was what you meant. It's an Easy Way Out."

Small. No longer, no thicker, than his forearm. But unbelievably expensive. This sleek blue plasteel cylinder with its white cap on one end, bedded in a shock-absorbent lining covered with red velvet, might easily have cost half as much as the *Pennyroyal.*

It was a legal development of an earlier device which had had to be banned because on planet after planet it had stolen the hope of survival from pioneers worn out with their attempts to overcome the infinite problems an alien world could pose. Cynical and cold-blooded entrepreneurs had bought early versions of

the machine—which filled half a spaceship—and made fortunes by luring settlers into imaginary universes so delightful they were happy to starve to death rather than give up their next session of pleasure. Several worlds that were now officially freehold in the power of a single family had been, as one might say, "cleared" in this manner.

When the scandal threatened to reach epidemic proportions, Earth's sluggish government had finally enacted a law. By then, however, the profit to be had from using the machines had shrunk; there were few worlds remaining to be grabbed. And in addition miniaturization had—as always—progressed, so that they could be held in one's hand instead of sprawling out through a fifty-meter hold. Also as always the law was a compromise. It was not forbidden to manufacture the things, only to purchase or use them if one was not a bona fide space traveler or engaged in some occupation so dangerous as to involve the risk of fatal accident. In practice, that meant they were sold to space tourists, government officials, and chief officers of spacelines. They were rich.

Activated—and all it required for activation was a twist of the white cap and firm push—it broadcast a signal direct to the brain of anybody within range, in other words within about a hundred meters. The signal forged a link, so to speak, between the brain's pleasure centres and the memory, diverting the remaining resources of the body into the construction of a delectable dream so absorbing, so convincing, that minor matters like loss of blood, or starvation, or intolerable pain, were instantly forgotten. Trapped in a collapsed mineshaft, sunk beneath an ocean with an hour's worth of air, lost between the stars, one could live out the balance of his life in an ideally happy illusion. According to temperament, it could be erotic—or an orgy of

eating—or a tussle with a favourite hallucinogen—or the accomplishment of a lifelong ambition—or . . .

Or anything. Literally, *anything*.

In principle, then, it was a marvelous and humane idea. What fate could be crueler to an aware, sensitive being than knowledge of inescapably impending death? When there was no hope of rescue, better that a man should end his days in unalloyed delight!

Fine.

But the moment that cap was pressed home, it was certain that he *would* end his days. It was a gesture implying suicide. Once those new neural paths had been burned into the cortex, there could never be any retreat from death.

According to what Pavel had read, this had not been true of the earliest versions. One could recover from those, as one could from the ancient addictive drugs, at the cost of incredible self-discipline and long, slow, painstaking psychiatric help. With a model as advanced as the one he held now . . . no.

He shut the lid and jumbled the lock again, and carefully placed the case on a shelf where Andrew could not reach it.

"What are you doing?" Andrew cried. "You said you knew what it was! Can't you turn it on?"

"Yes." Pavel averted his face and focused his little torch on his medical gear, making a great business of picking out what he would need to complete the job he had barely started.

"Then. . . !"

"Oh, shut up!" With a fury that appalled him—it was no tone for a doctor to use to a patient. "Or I'll shut you up!" He grasped an anesthetic injector, not local like the one he had already administered, designed to inactivate pain-nerves selectively, but one which would blot out the whole nervous system. "In fact"—with grow-

ing resolution—"I guess I'll do that anyway!"

And clapped the injector against Andrew's arm.

"You bastard" Andrew husked. "You devil! You . . . !"

On the last word his voice failed. His eyes, glinting in the pale beam of the torch, shut against his will, and seconds later he slumped inert.

It's kinder, anyway. . . .

But Pavel knew, even as he pulled the coverlet from the bunk and mechanically began to occupy himself with the foul job of cleaning excrement and dried blood from Andrew's lower body, that that was not the truth. There had been as much violence in that act as if he had given Andrew a punch on the jaw. And the reason why he needed to let his violence erupt—

Well, even though his mind was preoccupied with his work, even though the effect of the stimulant injection he had given himself was half used up by the low-oxygen air and the hunger which now—paradoxically—was making his stomach growl audibly, he was able to reason it out. He was scared out of his wits. He was very young by modern standards, if not as young as Andrew, being only thirty-five and looking forward to a probable lifetime of at least a hundred and twenty. Proportionately, he *vis-à-vis* Andrew was in the same situation as a man just come of age at twenty-one would have been when dealing with a twelve- or thirteen-year-old boy before mankind began to colonize other solar systems: very much aware of the drawbacks of being adolescent because they were still so fresh in his own memory, yet terribly impatient with the consequences of being adolescent because he was so exhausted by having gradually conquered them in himself.

As though imposing a penance on himself for his surrender to anger and fear, he made a particularly

thorough and careful job of the cleansing process, undertaking manually some of the most revolting parts which he could have used an instrument for, assuming the instrument was working after the crash. Eventually, however, he decided that the stimulant was wearing off completely, and he ought not to take a second dose before eating.

By then he had done absolutely all he had the resources to do: Andrew was in a spider's web of medical devices, two or three of which he had had to return to the surgery to bring, which would minimize pain, extract fatigue poisons direct through the skin, cleanse him whenever his bowels and bladder leaked, and insure him against the vanishingly small risk of some degenerative infection such as gangrene. Provided rescue arrived within fifteen days, he should not merely survive, but survive in good enough health to endure the major operation on his spine necessary to restore his power of ambulation. It was an achievement to be proud of, especially since Pavel had been prevented from using so many of his regular tools owing to the risk of them suffering damage in the crash.

Now it was high time he thought about himself . . . as clearly as the air would allow him to.

He was thirsty, he realized, not just dry from the arid air of this planet but actually dehydrated from his hard work. He had a number of phials of distilled water in the surgery, including several of liter capacity which had been so well-packaged they remained intact, and he had a fair supply of glucose solution and other instant-energy concentrates, various stimulants which rapidly invoked the "second wind" process in muscle tissue, many different tablets and capsules which, although intended exclusively for metabolic tests, could be used as nutriment in emergency, and even a

range of chemicals that generated free oxygen which he could use if the sparse natural air and the pressure of excess CO_2 were handicapping him for some really urgent task.

But so long as he could manage without drawing on those supplies, the better his chances would be of lasting until rescue arrived. He would rather starve until a ship came down to collect him, and leave with a store of unused supplies behind him, than . . .

Or—would he?

He sat down, only half intending to, on a stool which had surprisingly remained upright in the tangle of the surgery, and remembered to shut off the torch he was carrying. A little light, now very red because the sun was setting, showed his surroundings to him. He faced, at long last, the fundamental reason for his . . . his *attack* on Andrew.

He didn't believe with his whole being that he was going to be rescued. He didn't believe that anything would be done to organize search parties until the *Pennyroyal* was so much more overdue than the normal range of variation in her schedule that somebody on Carteret grew angry. He hadn't made many trips with Magnusson's ship, but he was well aware that a difference of a week or two one way or the other in their time of docking on any given planet which the ship serviced didn't seem to worry the captain. Unless he could improvize a beacon, preferably a powerful radio beacon. . . .

And he was trained in medicine, not engineering or electronics. If he was reluctant to use his own professional aids because he feared they might have been rendered unreliable, how could he trust a radio or subspace signaler even if he managed to rout one out from the mass of sand engulfing the after part of the ship and connect it to a power supply? How would

he know whether it was crying for help, or simply lighting up the state-of-circuit lamps?

He thought of the daunting process of shoveling sand away, encountering corpses, being frustrated because food capsules had smashed open and the contents were uneatable, which he had to undergo if he was really determined to survive.

And then thought of the Easy Way Out.

Yes, that was what was frightening him, more than the risk of dying here, forgotten, on an uninhabited world.

If he had not known that the EWO existed, if he had been able to occupy himself solely with problems of survival, he might have made it. As things stood, knowing that the choice lay between an agonizing death and a delightful one, he—

"NO!"

It astonished him that he shouted it aloud, and leapt to his feet in the same moment. Something in the very depths of his mind had said: *I don't want to die at all.*

That made sense. He didn't want to be here on Quasimodo IV. He didn't want to have a vast ache all down his legs and a twisted ankle and a dry throat and particularly he didn't want a patient who insulted him when he was trying to help. But he did want to live. With almost three-quarters of a lifetime ahead of him, he hated the idea that he might be doomed by someone's damn-fool carelessness!

Unsteadily, head pounding, with only the pencil beam of the torch to guide him, he set off on a second exploration of the ship.

Hours passed. His watch was working, but he had forgotten to check it when he awoke after the crash, and when it did occur to him to look at it he found it wasn't much use. It had been set to the arbitrary ship's day, and assured him the "real" time was a few minutes

before noon. Only the star-spangled sky of which he caught occasional glimpses remained dark, and he vaguely remembered seeing somewhere that the day of this planet was much longer than Earth's, well over thirty hours. So it wouldn't even be possible to predict dawn until he had seen one, and another sunset.

But that was a minor matter. He had biological clocks in his body which were more important, and the loudest-chiming one was in his belly. He was sure that by now his increasing weakness was due less to lack of oxygen and his many bruises than to simple hunger. And, inescapably, thirst.

Accordingly he directed his first efforts at digging towards where he knew the ship's restaurant had been located, on the side of the hull opposite his surgery. But this had been crushed far worse than the other side, and the sand was piled high and spilled down to replace whatever he scrabbled away. He was on the brink of despair when he recognized something shining in the beam of the torch.

Sand-scraped, the label told him plainly: WHOLE MILK.

He seized the bulbous can and raised it to his lips, ignoring the sand which clogged the outlet. The sand was presumably sterile, and if it wasn't, he'd already been exposed over and over to whatever minor life-forms it bore. He gulped the milk down in huge draughts, thinking with a detached portion of his mind that there was—or should have been—something symbolic in this action.

But this planet was not one which he could envisage substituting for Mother Earth.

After that he found a whole group of similar containers, apparently the contents of a shelf which had been slammed through a bulkhead in the crash. Many of them were crushed and had leaked their contents, but

he recovered more milk, various types of consommé and broth, and five or six types of purée. Beyond, there was a mess of fresh fruit, including apples, papayas and a mutated citrus he was fond of, called yabanos, resembling a lime bloated to the size of an orange and with deep pink flesh. He eagerly tore at its peel, and had already set a chunk of it to his lips when he realized what his sense of touch had been trying to warn him about: the crash had hurled this fruit into something made of glass, and the glass had smashed. The whole of it was permeated with tiny sharp spikes.

He spat it out and threw it away in fury. If this was what was going to happen everywhere, he might as well—

NO! NO! At least this time he didn't shout it aloud, but he said it inside his head, very forcibly: *I am not going to take the Easy Way Out! I am not! I am NOT!*

And then honesty which he detested compelled him to add: *At least . . . I don't think I am.*

He took one final look at Andrew, who was still unconscious, and gave him an injectorful of glucose-and-vitamin booster. He had found a few phials of that intact, and there were also some high-protein concentrates and other life-supports. But Andrew was carrying enough fat on his belly to last him several days, and he certainly wasn't going to become dehydrated overnight . . . or whatever the equivalent of "overnight" might be, measured in terms of how long it took Pavel to wake up after he collapsed on his pile of furs. His own cabin, far astern in the crew's quarters, was unreachable, but a dozen furs in the corridor afforded a soft bed within earshot of Andrew if he recovered consciousness.

The rest . . .

could wait . . .

until later. . . .

"Turn it on! Damn you—damn you! *Turn it on!*"

Pavel came awake in a second. The cry, eerie in the echoing corridor, had seemed a continuation of the dream he had been suffering, a vision of endless wandering over a vast bare desert. He forced himself to his feet, aware of the nasty clinging of his clothes to his body—normally, he changed them twice a day and threw the worn ones in the recycler, but that was smashed. At least during the night a breeze must have blown away the stench left by the fires inside the ship; the air now, although still very dry and oxygen-poor, smelled of nothing at all.

When he lay down to sleep, he had set the torch and a number of flasks and medical phials nearby. Now, though, he did not need artificial light—the sun must be well up in the sky and pouring in through all the cracks in the hull—and he was too dazed to worry about the other things. He stumbled into Andrew's cabin, rubbing his eyes.

Calm overtook him as he saw the medical equipment he had rigged yesterday. Being self-powered, against failure of the ship's power, its state-of-operation lights continued to gleam like little reptile's eyes. And indicated no change worth noticing in Andrew's condition: metabolism survival prone, skeletal structure paralysis-prone, nervous system pain-prone. . . .

"That! That thing!"

Andrew shouted, as loudly as he could, and raised his right arm to point at the shelf where Pavel had set the EWO.

"Turn it on!"

Pavel drew a deep breath. His head felt as though it had been stuffed with sand from outside, his mouth as dry and harsh as though the sand had been inserted by that route, and his stomach was full of gas-bloat. Also his ankle seemed to have become worse during his

sleep, not better, and when he rested his weight on it he winced.

Reaching out, he took the EWO off the shelf and wordlessly carried it from the cabin. Behind him, Andrew screamed and howled.

It occurred to Pavel that he should pitch the EWO out of the ship altogether, into the sand, where night wind would cover it and make it impossible to find again. But even as he was tensing his muscles to toss the thing away, he relented. Rescue, after all, might *not* come. . . .

Of the many cupboards in his surgery, all had been flung open in the crash, but one had not had its doors torn off the hinges. He put the EWO inside and slammed the doors and twisted the lock shut, thinking as he did so: *out of sight, out of . . .*

My mind?

But he didn't want to think about that. He had dreamed about it.

When he returned to Andrew's cabin he heard, from several metres away, a helpless moaning noise. He hurried his last few steps, and there indeed was Andrew with his hands over his face, weeping.

"Okay, okay!" Pavel said, and touched the younger man's arm reassuringly. "I'm here, and I have my—"

"Turn it on!" Andrew repeated, his hands muffling the words.

"I've taken the EWO away," Pavel said, and waited.

"What?" The hands dropped from Andrew's tear-wet face. "But it's mine! If I tell you to turn it on you've got to turn it on! I can't bear to lie here and suffer this *pain!*"

"Would you rather throw away the rest of your life," Pavel said after a moment to ponder the right form of words, "than survive to enjoy all these things you kept boasting about on the trip—all the money, the luxury,

the power your family's possessions will bring you?" . . . .

"I. . . ."

Andrew hesitated, letting his arms fall to his sides. He looked with fear-filled eyes at the medical equipment enclosing his body from the waist down.

Pavel went on waiting.

Abruptly—and unexpectedly—Andrew said, "I guess if you don't have too much anesthetic left you'd better save it for when I start to scream. But do you have a tranquilizing shot?"

A wave of relief swept over Pavel. He had never heard Andrew speak in such a reasonable tone before. He said, "Sure. Not much of that is left, either, though. My whole stock of drug phials was thrown through the surgery bulkhead along with me, and even if some of them were saved from breaking by landing in the furs it'll take a while for me to dig them out. Here's something to be going on with, at least."

He selected the right injector from the mixed batch he had brought, and applied it.

"Thank you," Andrew said, even before it had taken effect. "I—I guess I should apologize for shouting at you, hm?"

Pavel shrugged.

"How are you?"

"Me?" Pavel's surprise showed in his voice. "Oh . . . oh, I'm not too bad."

"I asked you a question! Don't I deserve an answer?"

"Well . . ." Pavel licked his lips. "My head aches like fury, but I guess yours does too. It's the air. My throat is sore, but that's the air too—it's very dry. When the crash came I acquired a gang of bruises and a twisted ankle. Now you know. And as a doctor I can promise you I'm in far better shape than you are."

"Obviously." A ghost of a smile showed on Andrew's pale plump face. "I'm in the kind of mess it would

take a major hospital to cope with, aren't I?"

Pavel nodded. There was no point in trying to conceal the truth.

"Then why the *hell* won't you turn on the EWO?" Andrew blasted.

Pavel froze. He said at last, "You spoiled brat. You—you . . . oh, I don't know a name bad enough for you!"

"Now look here!" Andrew began, but Pavel plunged on.

"Before you try any more of your tricks, get this into your solid plasteel head, will you? I want to stay alive even if you don't! You've been pampered all your life so much that even a hint of pain makes you want to give up forever. You can't con me into doing what you want, you can't threaten me into doing what you want, you can't wheedle me into doing what you want. For once in your life you are simply going to have to do what someone else wants!"

There was a dead silence. Since Pavel had woken, the whole ship had been silent, apart from the soughing of a light wind across the gaps in the hull. The trickling noise he had heard yesterday in the surgery, the sifting noise of sand filling a few remaining spaces in the after part of the ship, the creaking of the girders as they cooled—all that had come to an end. The only items in operation, the medical equipment, were too efficiently designed to make a noise even after the punishment they had taken.

Then the artificial calm of the last shot he had been given overspread Andrew's face. He said, "Well, if you're so determined to keep me alive, you might as well make me comfortable too. I'm in pain, you know."

"All right," Pavel conceded. "But I'll have to make it a short dose. I'll have to accustom you gradually to supporting some of your pain, I'm afraid. There's no way of estimating how long it will be before we're rescued."

He produced and applied the correct injector.

"And I'm afraid I can't be absolutely certain how badly your internal organs are affected," he went on. "To be on the safe side, I'll have to keep you hydrated with an intravenous transfusion rather than letting you drink."

"But I'm very thirsty," Andrew said in a dull tone, his eyes drifting shut.

"I guess you must be. I have some tablets you can suck to keep your mouth and throat moist, but they'll have to be rationed out, too."

"Because we may be stuck here a long time," Andrew murmured. "What makes you so sure we are going to be rescued, hm?"

"Look, we're in the same system as Carteret," Pavel said. "We're going to be reported overdue. If there was a live detector anywhere in the vicinity, it will have picked up our blip. It might even have tracked us to impact."

"Hell, if it tracked us to impact, no one will bother to come searching," Andrew said. "Everyone was killed but us, right? If they calculate the speed we had when we broached air, they'll take it for granted we just burned up!"

Pavel was half-convinced of that himself, but he put on his most reassuring manner.

"Not if I can dig out something to make a beacon with," he said. "I'm not an engineer, but I hope to find a solid-state transmitter sooner or later, and a capacitor or something to drive it with. I'll—uh—I'll leave you now and get on with it."

"Thirsty!" Andrew said.

"Oh, of course. I'll get you one of those tablets to suck."

Behind the closed cupboard doors the presence of the EWO seemed to mock him when he entered the surgery.

Then, having made a frugal breakfast from half a can of fruit purée, Pavel sat down to work out a plan. In this sparse air he dared not overexert himself; on the other hand, he must work quickly in order to improve their chances of survival, either to fix the beacon he'd talked about or simply to locate more provisions.

In a while, despite his aching head, he had what seemed to be a logical course of action. He hunted around for something he could adapt as a shovel, found a plastic chair with one metal leg still attached and, by wedging the leg in a crack in the wall and leaning on it with his full weight, straightened it so that the chair-seat made a kind of flat scoop, and the leg a handle. Fine. Very pleased with himself, he set about digging where he had found the bulbs of soup yesterday.

And almost at once discovered a mangled corpse.

The thought crossed his mind that if he absolutely had to, he could reserve the canned supplies until last, and eat meat. It should remain good for a long time in this dry air, away from Earth-type bacteria.

Revolting! cried his subconscious. *Better the EWO than cannibalism!*

Maybe.

He moved the body and with much effort dragged it to a gash in the hull, and pushed it outside. He scrambled after it, dragged it out of sight down the dune and flung a few shovelfuls of sand after it. Then, aching in every limb, he decided to walk around the ship instead of going straight back inside. The going was very difficult; the dune was so dry, he sank in over his ankles at every step. But he managed to carry out a complete inspection of the exposed part of the ship, and the more he saw, the more he marveled at his own escape. A bare fifth of the vessel's length was visible, and as badly cracked as a hard-boiled egg ready for shelling. His heart sank. Was there any hope at all of finding service-

able equipment to rig his beacon?

Well, there was only one way to find out. He went back to his digging.

After that, time passed in a monotonous slow blur. He fell immediately into the routine which he was to follow for the whole of their stay. He dug for a while, making either the discovery of a corpse or the location of a bit of intact equipment the excuse to break off, and then went to see Andrew and attend to his requests or—more and more often—inform him that they couldn't be met right now, because there were only a handful of injectors left, or the medical equipment reported that it would be dangerous to give him more liquid by mouth, or there was some other reason for denying him what he wanted.

The first time he told Andrew he would have to lie in pain a bit longer before another shot, Andrew curled his lip back and said, "I've got you figured out. You like this."

"What?"

"You like this. You like having someone totally helpless, the way I am. Gives you a sense of power!"

Sweat beaded his face, but evaporated almost at once into the dry air.

"Nonsense!" Pavel said roughly, looking over the equipment at the foot of the bunk. One of the lights which had been green had turned red. But there was no help for that.

"Oh, I know your type!" Andrew snapped. "Nothing suits you better than—"

"Shut up," Pavel said. "I'm trying to keep us both alive. And, if possible, sane. Don't start on crazy fantasies like that, or you'll run the risk of making me angry. And I'm already living on my nerves."

"So what does a doctor do when his patient makes him

angry? Turn off the life-supports?"

"No." Pavel drew a deep but unsatisfying breath. "Gets out of earshot of the goading, and stays there."

He marched out of the cabin and slammed the door. In the corridor he leaned for a while against the wall, head on hands. If this was going to go on indefinitely. . . .

But there was work to do. He roused himself and returned to it. Not for the first time as he mustered all his energy and thrust the improvized shovel into yet another heap of sand, he wondered sickly why he was wasting his time. He was now well into the section where he ought to have located usable electronic or subelectronic equipment if any had survived, and all he was finding was charred or half-melted masses of metal and plastic. There had been a fire here, and a hot one. Also, now and then, he found items from spacemen's uniform, such as buckles and rank badges. And there were bones.

It took him almost three days—daytimes, rather—to clear the section of the ship of which he had the highest hopes. The only thing he found which was any use at all was a solid-state emergency lamp, its lumen-globe intact and its powerpack barely below maximum. When he came upon it, night was falling. He switched it on, thinking how wonderful it was to have a proper light.

And then, with a pang of conscience, how terrible it must be for Andrew lying alone in the dark, forced to wait hours between anesthetic shots. He picked the lamp up and carried it to Andrew's cabin.

He was dozing, and did not at first react to the sound of the door sliding back—it moved noisily now, because the finest grains of sand sifted everywhere when the wind rose, and the groove at the bottom was covered with them. When he opened his eyes, however, he did not comment on the lamp.

He said, "Pavel, you—you look terrible!"

"What?" Pavel touched his face. He had three days' stubble on it, of course, and no doubt dirt and sweat had mingled to cover his skin with a layer of grime . . . but he hadn't given the point a thought for a long while.

"Could be," he said gruffly. "But never mind. Here, I found this lamp. I thought it would be useful for you. I could get you something to pass the time now you have light. Uh—maybe a book, if you like reading. Or a game from the recreation room. I dug into that and found a few things."

But Andrew seemed not to be listening. He said, "Why in the galaxy are you driving yourself this way? Did you find a way to send a signal to a search party?"

"Uh. . . ." Pavel licked his lips; they tasted of dust. "I found quite a lot of stuff already, but—"

"But it doesn't work?"

"No, I'm afraid it's all smashed up."

"I thought it would be," Andrew said. Now, by the bright clear light, Pavel could see that his cheeks had suddenly become sunken, and there was another lamp shining red on the medical gear enclosing his legs, which yesterday had been green. Red for danger. "Pavel, you ought at least to leave the EWO where I can get at it! Suppose—well, suppose you dig into somewhere and a girder falls on you? Suppose you're hurt and can't get back to wherever you put the thing?"

"I don't want to use it," Pavel said obstinately.

"And you won't keep me free of pain all the time!"

"I can't because—"

"Oh, save it!" Andrew sighed, and rolled his head to the side opposite the lamp, shutting his eyes again.

The ungrateful bastard, Pavel thought, and strode out.

That night, like the previous nights, he dropped off to sleep the moment he lay down on his couch of furs in the passageway outside Andrew's door. He dreamed of far-off worlds where he had been happy and relaxed,

where he had basked in warm sunlight and eaten luscious meals in the company of pretty women, where—

Has Andrew somehow got at the EWO and turned it on?

That thought blasted through the euphoria of his dreams and brought him bolt upright with a jerk. Standing up and waking were simultaneous. It was dark, he had turned off the lamp to conserve its powerpack, Andrew being asleep also. But he had left it on a shelf just inside the cabin door, and the door was ajar. He located it by touch and switched it on.

Andrew was lying, very pale, sweating again, with his fists clenched and his jaw set, and another red light had appeared at the foot of his bunk.

"Damn it, you're in agony!" Pavel burst out.

"I didn't want—to—wake you," Andrew forced between his tightly clamped teeth. "Thought you—you deserved your rest."

What in the galaxy was happening to this spoiled young man? But Pavel wasted no time on wondering about that. He had, as usual, placed a selection of drug phials and other equipment by his couch. Seizing a painkiller injector, he gave Andrew a full shot.

"Thanks," the younger man whispered, and the drawn expression faded from his face. "Sorry I disturbed you. I guess I cried out without meaning to."

"That's okay," Pavel said awkwardly.

"You know something?" Andrew went on, staring at the ceiling. "I've been thinking. I guess I never had to think so long about the same thing, over and over, in my life before. When the crash happened, I was so scared. I didn't realize. I kept telling myself it couldn't possibly be happening to me—not to Andrew Alighieri Solichuk-Fehr! And . . . well, the way I see it now, I went on trying to hide the truth. Didn't I? Don't bother to answer. I know I'm right now. And here you've been

working like a—like a robot, and knowing what can be done and what can't, and . . . well, imagine it had been the other way around! Imagine that I'd been up and walking about, and you were stuck in a bunk like me, busted all to hell. I wouldn't know what to do! I'd go crazy! I'd have just turned the cap of the EWO and given up."

Pavel listened, hardly believing his ears.

"So I . . . well, I'd just like to say I'm obliged to you. I think it's the most amazing luck that you were the other person who survived. It's finally dawned on me that without you I'd be dead."

His fists clenched again, but not—this time—from pain.

"And you're right! It's stupid to die when you don't have to! It's stupid to quit just because you can't take a little pain, just because you're gambling on the chance of being rescued and you can't figure the odds! Hell, I've gambled on a dozen planets, for things much less important than life—for mere money! And I swear I wouldn't have bet on my chance of still being alive after that crash!"

"Nor would I," Pavel said in a gravelly tone. From the corner of his eye he noted that the last red light had reverted to green, a sign that it had been the pain which was putting the dangerous stress on Andrew's metabolism. Dilemma: whether to keep the pain damped down, in order to protect his life-functions, or to husband the supply of painkiller and make his life bearable, if not comfortable, for the greatest possible length of time. . . .

It was too much to think about right now, his mind still muzzy with sleep. Anyhow, Andrew hadn't finished.

"You're sure we're on Quasimodo IV?"

"Ah. . . ." Until this moment, Pavel hadn't been certain that Andrew had taken in the information he'd

been given about their situation. "Yes. At least, as sure as I can be without checking out some sort of data on the system we were bound for. I haven't dug into a library section yet, but I think I'm coming fairly close."

"Well, instead of wasting my time on games and that sort of nonsense, why don't you bring me what you can salvage in the way of books and reels? I guess if there's a magnifying glass or microscope to be had, I can make out a reel. But without power there can't be much hope of reading tapes, hm?"

"True enough. But—sure, I'll do my best. Find some way of magnifying a reel so you can read it up against that light."

"Great," Andrew said. "Now you go back to sleep, or fix your breakfast, or whatever you want. I'll be okay until this shot wears off. And I'll try and be okay until a good while afterwards. Just as long as I can honestly stand the pain."

Fantastic! Pavel kept thinking as he burrowed deeper and deeper into the accessible regions of the ship. *To have found that degree of guts when he must be in agony!*

It helped—helped enormously—to know that he had a companion in adversity after all, someone he could talk to instead of a burden on his time, a constant worry. He did in fact locate a scratched and broken piece of transpex with a high magnifying factor, and some data reels and a few scorched books whose pages had to be turned very carefully in order to prevent them crumbling, and Andrew, propped up just a little on his pillow, somehow contrived to read a few of them by the portable lamp. There were only passing references to Quasimodo IV—it never having been a planet of much interest to spacemen—but what little he gleaned confirmed that that was where they were, and

moreover that they were currently on the same side of the local sun as Carteret.

But in that case . . .

Why haven't we been rescued already?

The fourth, fifth, eighth day melted into the past, almost featureless. Now, the long strain of working in low oxygen was weakening Pavel; he hated waking up, and often his digging reduced to the mindless act of a machine, so that he had already shoveled aside a piece of potentially useful equipment before his sluggish brain recognized it. Then he had to go scrabble for it with bare hands in the pile of sand behind him. And, of course, all the time he kept finding dead bodies.

For a brief while, following Andrew's remarkable discovery of courage, the cupboard where he had stored the EWO held no threat to Pavel. A day, two days, later, and the blisters on his hands and the grit in his mouth and the redness of his eyes and the endless, incurable thirst he suffered from, conspired to re-awaken its specter in his memory. Instead of being here, victim of harsh reality, he could be in a lovely imaginary world, enjoying himself in any way he chose, picturing the most beautiful girls, the smoothest lawns, the finest beaches, the—

Stop it!

But the supply of drugs dwindled, though he hoarded them carefully, and so did the protein concentrates and glucose-and-vitamin solutions which were all the food he could offer Andrew. Luckily, he had had just enough of a substance which triggered the body's use of stored fat—a short-cut for overindulgent passengers, basically, who now and then realized at the end of a long spaceflight that they had put on two kilos while they were shut up in the metal shell of the ship and wanted to revert to normal before landing. He had never expected to make practical use of what he ordinarily regarded as

a cosmetic drug. The two injections of it which he had given to Andrew, however, had worked well, and though his skin was now deflated over his premature paunch, like a partly shrunk balloon, he was able to utilise what long overindulgence had stored between his muscles and his skin.

Pavel took more and more frequently to going outside and staring up at the sky, knowing it was ridiculous to do so. One couldn't see an orbiting rescue ship by day, and if it arrived during the night it would no doubt fire signal flares and perhaps sonic missiles to wake survivors up and provoke them into lighting fires, or somehow revealing their presence.

Fires!

That idea should have come to him much earlier; in fact, it didn't strike him until finally he had to concede that further digging was useless. The part of the ship he hadn't yet cleared of sand was collapsed, and he lacked the strength, and the tools, to force aside the strong metal girders now blocking his progress.

He had been aimlessly postponing the admission that there was nothing else constructive he could do, when the notion of making a fire occurred to him. At night, in particular, a fire could be spotted a long way off under such a clear sky. He had seen clouds only once since the crash, and they had been on the horizon around the setting sun. Presumably there was ocean in that direction, but a rise in the ground—a range of hills or mountains—filtered all the moisture from the wind before it blew this far inland.

Andrew had found scant reference to the meterological pattern of Quasimodo IV in the charred books Pavel brought him. So many page-edges were burned away, so many details that might have been useful had gone up in smoke!

But was there anything left which would flame

brightly in this thin air? Pavel made tests, cautiously, with flammable liquids from his surgery: alcohol, ether, some otherwise useless tinctures and suspensions which bore fire warnings on their labels. Satisfied that it might indeed be possible to light a fire if the fuel were first soaked with everything he had which burned, he set about resifting the great mounds of rubbish he had thrown aside, dividing them into two new categories: things that would catch alight, and things that wouldn't.

That occupied a day or two more.

Little by little, however, he began to find himself obsessed with the passage of time. He kept saying under his breath, "Now if we can last out four more days—three more days. . . ."

Until, with a shock, he caught himself. There still was no promise of rescue. In his mind, the fifteen-day period he had estimated as the limit of the time he could keep Andrew alive had evolved into an article of faith. *If we last out fifteen days we'll be okay.*

What grounds did he have for believing that? On the contrary, he realized, now that eleven, twelve, thirteen days had leaked away, their chances of being saved were less, not more. Even if Magnusson had been notoriously sloppy about routine matters such as signaling to the port he was bound for when his ship broached normal from subspace, they should have started searching long ago . . . if any detector had picked the *Pennyroyal* up.

It followed that Magnusson hadn't signaled. They could have been eclipsed behind this damned desert planet when they emerged from faster-than-light mode, in which case detectors orbiting Carteret would not have recorded a blip. And their plight was hopeless after all!

The vision of the EWO shut in the cupboard rose before him and sang an inaudible song of mockery.

Weakened by his efforts, and short oxygen and barely sufficient food, he had taken to spending an hour or two each day between exhaustion and slumber in conversation with Andrew. The first few times had been a sort of stimulant for him; he had never had any clear conception of what life was like for someone who was due to inherit one of the great fortunes of the galaxy, coming as he did from average, ordinary stock on both sides of his own family: pioneers five generations back, who seemed to have used up their lines' ambition and initiative in the single crucial act of leaving Earth, and never regained it.

He himself, by deciding to sign as a space medical officer before settling to a regular career, and moreover saying that it might not be on his home world of Caliban that he chose to practice, had shocked all his relatives. They weren't geared to star travel any more. By contrast, Andrew's background since he was born had included the concept of galaxy-roaming: "Uncle Herbert is on Halys and sends his love," or maybe, "I think we'll take the kids to Peristar this year."

Not that Andrew himself had appreciated his good fortune until now. He had looked on it rather as a distasteful duty than a reason for excitement and enjoyment when he was instructed to go tour the family holdings.

Now, listening to Pavel explaining his attitude, he seemed to have come around to the view that he'd been stupid, wasting an opportunity thousands, millions of young men would have sold their right arms for. Head constantly aching, unceasingly shaky on his feet and having to concentrate with all his force like a man struggling to pretend he isn't drunk, Pavel had done his best to encourage Andrew . . . until the evening of the day when he admitted to himself that even if they did last out for the two weeks he'd invented as a deadline

they were probably doomed anyhow.

Then, he was snappish and ill-tempered, heard his own voice reviving accusations from the *Pennyroyal*'s last voyage—references to Hans, references to drunkenness, references to laziness and greed and lack of consideration for other passengers. Hurt, at first surprised, later angry, Andrew retorted in kind, and the should-have-been friendly chat wound up with a grinding slam of the cabin door.

But the last thing Pavel had glimpsed as it shut was not just one more red light—he'd grown accustomed to one a day, on average, added to the original total—but a whole new cluster of them, which yesterday had been green.

Shaking from head to foot, he waited in the corridor for as long as it took to calm himself. Then he reopened the door.

"I'm sorry," he said. "I'm ashamed of myself. You're in terrible pain. The lights. . . ." He gestured at them. They were naturally turned away from the patient, so he shouldn't see them.

"I know," Andrew muttered.

"What?"

"Of course I know!" With renewed anger. "That machine of your wasn't designed to be used in a completely dark room, but a hospital ward with twilight oozing out of the walls—right? Every night when you switch off the lamp for me to go to sleep, I can see the light reflected over there"—gesturing—"and I can tell that it's more red than it was before. I know I'm in a bad way, for heaven's sake! I *know!*"

The last word peaked into a cry.

Pavel bit his lip. He said, "I guess I haven't been completely honest with you. I . . . well, I no longer believe in being rescued. If we were going to be rescued

it ought to have happened by now. Do you want me to—?"

"Switch on the EWO?" Andrew broke in. "No! No! And no again! You were right to take it away from me. Lying here, pain or no pain, I've come to realize how precious life can be. No, I don't want you to use it. Take it out and bury it—smash it with a hammer—anything!"

But his voice cracked with pain, and sweat glistened on his skin.

"Well—uh—all right then," Pavel said. "Uh—good night."

"Good night."

Pavel dreamed about the EWO again.

And then, in the morning, the nightmares didn't stop.

When he opened the cabin door, having slept badly and twice having had to force himself to stay awake for ten or fifteen minutes so that when he dropped off again he would not drift straight back into the horrors he had fought to free himself from, he found Andrew not just asleep but unconscious. All but four of the lights on the medical equipment had gone to red. A glance at their pattern confirmed that it was the struggle to resist pain which had worn him out—that, and the exhaustion of the last phial of nutrient solution in Pavel's limited stock. There was enough water left to keep him hydrated, and enough tissue in his muscles for the "second wind" process to keep his basal metabolism turning over for a few more hours—perhaps a couple of days, if he remained inert.

Beyond that point . . .

Certain death.

Pavel stared in giddy disbelief. He tried to tell himself that it was an achievement to have kept Andrew alive and conscious, in his condition, for such a long time—not fifteen ordinary days, as he had somehow been fool enough to imagine, but fifteen of these extra-long local

days. It was a medical miracle, in its small way. Hardly any modern doctor could have managed it without the aid of a full range of diagnostic and supportive equipment.

But what was the use of having done it, when nobody else would ever find out?

All hope seeped out of his mind. All his overstrained will to survive collapsed, like a bridge required to carry too great a load: folding, almost gracefully, into an unrecognizable tangle of struts and pillars. He was barely Pavel Williamson any longer as he turned with machine-precise movements and headed for his surgery.

In that cupboard he had passed so many times, the Easy Way Out.

He took it, sleek and chill, from its case, having no difficulty in remembering the combination of its lock, and turned it over and over. It was well past dawn, and there was plenty of light to see it by.

I denied him this, Pavel thought. *I could have ended his life in ecstasy instead of a vain, stupid, pointless struggle against pain. Now he will die, unconscious, and —and he turned out to be a nice guy, in his way. I feel almost fond of him . . . and horribly ashamed of myself.*

Because I'm going to use what I forbade him to.

Convulsively, he twisted the white cap of the EWO and pressed it down. It sank visibly along the main shaft, and there was a humming. Pavel closed his eyes.

Disbelievingly, he opened them again. All was exactly as it had been. Except the EWO. Heavy in his hands, it was now also growing hot. And—

He let it fall with an oath. A hissing noise followed, and a puff of smoke spurted from the capped end. The cap—some kind of plastic, he guessed—deformed and darkened.

After that it simply lay there.

He stared at it incredulously for a long while: how

long, he could not tell. He felt like a suicide who took much trouble over choosing and knotting a rope, only to have it break under his weight.

"I'll be damned!" he said furiously at last. "For all that pretty case with the combination lock—for all the padding it was nested in—it broke when we crashed! It doesn't work!"

The thing was no longer smoking. He touched it, and found it merely warm. Snatching it up, he swung around to leave the surgery, blind with rage.

"I'll pay him back for leading me on this way!" he heard himself shouting. "I'll get even! I'll. . . ."

What was that?

From somewhere outside, a roaring sound. The crumpled steel of the corridor vibrated. He stood stockstill, one hand already outstretched to slide back the door of Andrew's cabin.

The roar faded, and then grew louder again. He stared in horror at the EWO in his hand, thinking: *Did it work after all? Is this an induced illusion, the fantasy of rescue?*

But, surely, knowing how ashamed he had been when he was finally driven to try and use the gadget, he could rule that out. Any illusion he was capable of enjoying would exclude all memory of the EWO, because even to recall its existence would remind him he was condemned to death . . .

Uncertain, he turned around—and was suddenly running at full lung-tearing pelt towards the nearest opening in the hull, to light his beacon with trembling fingers and keel over beside it for the rescue party to locate.

"I—uh—I guess someone should apologize for not coming to find you sooner," said the doctor at the central hospital on Carteret. "But it was logical enough that all hope was abandoned the moment they computed the

Pennyroyal's course. I mean, you wouldn't expect anyone to live through a crash like that, hm?"

"I guess not," Pavel said. He felt very much better although this oxygen-rich air was still making him a trifle giddy. "And when they did turn up, it was only for salvage, right? Not for rescue?"

"I'm afraid so," the doctor admitted. "It was the insurance company covering that consignment of furs who chartered the ship which picked you up."

He hesitated. "By the way," he continued at last, "I'd like to compliment you on the marvelous job you did on Andrew Solichuk. You know his family is very big here on Carteret, and if he'd been found dead. . . ." He ended the sentence with a gesture.

"Yes," Pavel said. "Yes, it was a pretty good job, though I say so myself."

He looked absently out of the window. This was a splendid modern building, very expensive, surrounded by magnificent lawns and flowerbeds, and he could see a swimming pool and a sun terrace where patients were soaking in the sunlight. Absently, he caressed something smooth and heavy which lay on his lap. What . . . ?

Oh, yes. The EWO which hadn't worked.

He said suddenly, "How is Andrew now? I'd like to see him if I can."

"I imagine that can be arranged," the doctor said heartily. "Of course, he was in very bad shape when he was brought here, but when they heard the news his family back on Earth signaled that we shouldn't spare any expense, and he's had the finest surgery available on this planet. He's up and about already—and as a matter of fact, I believe he asked to see you. Come with me!"

Rising, he added with a chuckle, "Aren't you glad that thing of yours was broken after all?"

"What?" Pavel gave him a confused stare. "Oh! This?"

Rising, he hefted the EWO. "Oh, it's not mine."

"We assumed it was," the doctor said. "You were clinging to it for dear life. When you were undergoing your psychiatric reorientation, they wanted to take it away, but when I saw how violently you reacted to losing it, I told them they ought to let you hang on to it. A sort of mental sheet-anchor. But you say it *isn't* yours?"

"No, it belonged to Andrew." Pavel stared down at the thing, wonderingly. "It must have sunk all sorts of barbs in my subconscious if I clung to it like you say I did! I guess it's time I got rid of it. Hmm! I'll give it back to Andrew, let him know it wouldn't have helped anyway. He was on at me to use it, you know, for days and days after we landed. I mean crashed."

"I'm not surprised," the doctor nodded. "Suffering the way he was. . . . Still, according to what he's been saying, you infected him—so to speak—with the will to live. He's very anxious to see you again too, you know."

He courteously indicated that Pavel should precede him through the door.

And there he was: almost unrecognizably lean, nearly naked in the bright warm sunlight, with a few traces of scarring around his waist and lower back—but grinning from ear to ear. He had been in the swimming pool and drops of water were still running down his body, but he hurled aside the towel he had been about to use and advanced on Pavel with a shout of joy.

"Pavel! How can I ever thank you for saving my life? You were right, right all along! If it hadn't been for you, I wouldn't be here now, back in one piece, able to enjoy life again! Here, let me shake your hand. . . ."

And his voice changed, even as he put his own hand out.

"What's that?" he said faintly, and all the color faded from his cheeks. "It's . . . ! You bastard!"

"What?" Standing uncertainly before him, Pavel held

up the EWO. "You mean this? Why, I was just about to tell you. If you'd—"

"You devil!" Andrew snatched it from him and stared at the capped end. It was obvious that it had been pushed home. "You activated it! After all your pious preaching you activated it! And. . . ."

He looked as though he was about to be physically sick.

"And all this must be illusion after all! Which means I'm going to die—just as I'd finally found out how to enjoy being alive! You bastard, you *devil!*" His face contorted into a mask of fury.

"Now just a moment!" said the doctor at Pavel's side, stepping forward. Pavel himself was frozen with pure amazement, incapable of speaking, barely able to think.

But the doctor was too late.

Raising the heavy plasteel cylinder of the EWO above his head with all the force his newly discovered health and vigor afforded, Andrew brought it slamming down and smashed open Pavel's skull as completely, and as fatally, as the hull of the wrecked ship *Pennyroyal.*

EDITOR CHOOSES SELF

There are two reasons why I am including a story of my own in what I am calling the "best" science fiction, one a true one and one a real one.

The true one reflects nothing but credit on me. It is simply this: I paid most of the authors in this volume more money than I actually had available, and so at the last moment I had a big hole left in the book and not enough money to buy the stories I wanted to fill it. The only author I wanted to ask the favor of including a story for less than standard rates was me—so I included *The Gold at the Starbow's End.*

The real reason is that *The Gold at the Starbow's End* is one of the few, the very few stories in all my life as a writer, that came out of the typewriter exactly the way I wanted it to from first page to last. It has been nominated for a batch of awards. It scored exactly in the middle of the poll *Analog* conducted for the stories in the issues in which it appeared. (When I asked Ben Bova why, he said, "Because every vote it received was either first place or last.") And I have had more fan mail on it than on any other story of mine since *Day Million.*

But the real reason I included it isn't that somebody else says it's good, it is because when the last page came out of the typewriter *I* thought it was good, probably the best middle-length story I have ever written in 35 years of writing stories . . . and I hope some of you will think so too.

THE GOLD AT THE STARBOW'S END
by Frederik Pohl

CONSTITUTION ONE

Log of Lt. Col. Sheffield N. Jackman, USAF, commanding U.S. Starship *Constitution,* Day 40.

All's well, friends. Thanks to Mission Control for the batch of personal messages. We enjoyed the concert you beamed us, in fact we recorded most of it so we can play it over again when communication gets hairy.

We are now approaching the six-week point in our expedition to Alpha Centauri, Planet Aleph, and now that we've passed the farthest previous manned distance from Earth we're really beginning to feel as if we're on our way. Our latest navigation check confirms Mission Control's plot, and we estimate we should be crossing the orbit of Pluto at approximately 1631 hours, ship time, of Day 40, which is today. Letski has been keeping track of the time dilation effect, which is beginning to be significant now that we are traveling about some six percent of the speed of light, and says this would make it approximately a quarter of two in the morning your time, Mission Control. We voted to consider that the "coastal waters" mark. From then on we will have left the solar system behind and thus will be the first human beings to enter upon the deeps of interstellar space. We plan to have a ceremony. Letski and Ann Becklund have made up an American flag for jettisoning at that point, which we will do through the Number Three survey port, along with the prepared stainless-steel plaque containing the President's commissioning speech. We are also throwing in some private articles for each of us. I am contributing my Air Academy class ring.

Little change since previous reports. We are settling down nicely to our routine. We finished up all our post-launch checks weeks ago, and as Dr. Knefhausen predicted we began to find time hanging heavy on our hands. There won't be much to keep us busy between now and when we arrive at the planet Alpha-Aleph that is really essential to the operating of the spaceship. So we went along with Kneffie's proposed recreational

schedule, using the worksheets prepared by the NASA Division of Flight Training and Personnel Management. At first—I think the boys back in Indianapolis are big enough to know this—it met with what you might call a cool reception. The general consensus was that this business of learning number theory and the calculus of statement, which is what they handed us for openers, was for the birds. We figured we weren't quite desperate enough for that yet, so we fooled around with other things. Ann and Will Becklund played a lot of chess. Dot Letski began writing a verse adaptation of "War and Peace." The rest of us hacked around with the equipment, and making astronomical observations and gabbing. But all that began to get tiresome pretty fast, just as Kneffie said it would at the briefings.

We talked about the idea that the best way to pass time in a spaceship was learning to get interested in mathematical problems—no mass to transport, no competitive element to get tempers up and all that. It began to make sense. So now Letski is in his tenth day of trying to find a formula for primes, and my own dear Flo is trying to prove Goldbach's Conjecture by means of the theory of congruences. (This is the girl who two months ago couldn't add up a laundry list!) It certainly passes the time.

Medically, we are all fit. I will append the detailed data on our blood pressures, pulses, et cetera, as well as the tape from the rocket and navigating systems readouts. I'll report again as scheduled. Take care of Earth for us—we're looking forward to seeing it again, in a few years!

WASHINGTON ONE

There was a lull in the urban guerrilla war in Washington that week. The chopper was able to float right in to the South Lawn of the White House—no sniper

fire, no heat-seeking missiles, not even rock throwing. Dr. Dieter von Knefhausen stared suspiciously at the knot of weary-looking pickets in their permitted fifty yards of space along the perimeter. They didn't look militant, probably Gay Lib or, who knew what, maybe nature-food or single-tax; at any rate no rocks came from them, only a little disorganized booing as the helicopter landed. Knefhausen bowed to *Herr Omnes* sardonically, hopped nimbly out of the chopper and got out of the way as it took off again, which it did at once. He didn't trouble to run to the White House. He strolled. He did not fear these simple people, even if the helicopter pilot did. Also he was not really eager to keep his appointment with the President.

The ADC who frisked him did not smile. The orderly who conducted him to the West Terrace did not salute. No one relieved him of the dispatch case with his slides and papers, although it was heavy. You could tell right away when you were in the doghouse, he thought, ducking his head from the rotor blast as the pilot circled the White House to gain altitude before venturing back across the spread-out city.

It had been a lot different in the old days, he thought with some nostalgia. He could remember every minute of those old days. It was right here, this portico, where he had stood before the world's press and photographers to tell them about the Alpha-Aleph Project. He had seen his picture next to the President's on all the front pages, watched himself on the TV newscasts, talking about the New Earth that would give America an entire colonizable planet four light-years away. He remembered the launch at the Cape, with a million and a half invited guests from all over the world, foreign statesmen and scientists eating their hearts out with envy, American leaders jovial with pride. The orderlies saluted then, all right. His lecture fees had gone clear out of sight.

There was even talk of making him the Vice Presidential candidate in the next election—and it could have happened, too, if the election had been right then, and if there hadn't been the problem of his being born in another country.

Now it was all different. He was taken up in the service elevator. It wasn't so much that Knethausen minded for his own sake, he told himself, but how did the word get out that there was trouble? Was it only the newspaper stories? Was there a leak?

The Marine orderly knocked once on the big door of the Cabinet room, and it was opened from inside.

Knefhausen entered.

"Come in, Dieter, boy, pull up a pew." No Vice President jumping up to grab his arm and slap his back. His greeting was thirty silent faces turned toward him, some reserved, some frankly hostile. The full Cabinet was there, along with half a dozen department heads and the President's personal action staff, and the most hostile face around the big oval table was the President's own.

Knefhausen bowed. An atavistic hankering for lyceum-cadet jokes made him think of clicking his heels and adjusting a monocle, but he didn't have a monocle and didn't yield to impulses like that. He merely took his place standing at the foot of the table and, when the President nodded, said, "Good morning, gentlemen, and ladies. I assume you want to see me about the stupid lies the Russians are spreading about the Alpha-Aleph program."

"*Roobarooba,*" they muttered to each other.

The President said in his sharp tenor, "So you think they are just lies?"

"Lies or mistakes, Mr. President, what's the difference? We are right and they are wrong, that's all."

"*Roobaroobarooba.*"

The Secretary of State looked inquiringly at the Presi-

dent, got a nod and said: "Dr. Knefhausen, you know I've been on your team a long time and I don't want to disagree with any statement you care to make, but are you so sure about that? There are some mighty persuasive figures comin' out of the Russians."

"They are false, Mr. Secretary."

"Ah, well, Dr. Knefhausen. I might be inclined to take your word for it, but others might not. Not cranks or malcontents, Dr. Knefhausen, but good, decent people. Do you have any evidence for them?"

"With your permission, Mr. President?" The President nodded again. Knefhausen unlocked his dispatch case and drew out a slim sheaf of slides. He handed them to a major of Marines, who looked to the President for approval and then did what Knefhausen told him. The room lights went down and, after some fiddling with the focus, the first slide was projected over Knefhausen's head. It showed a huge array of Y-shaped metal posts, stretching away into the distance of a bleak, powdery-looking landscape.

"This picture is our radio telescope on Farside, the Moon," he said. "It is never visible from the Earth, because that portion of the Moon's surface is permanently turned away from us, for which reason we selected it for the site of the telescope. There is no electrical interference of any kind. The instrument is made up of thirty-three million separate dipole elements, aligned with an accuracy of one part in several million. Its actual size is an approximate circle eighteen miles across, but by virtue of the careful positioning its performance is effectively equal to a telescope with a diameter of some twenty-six miles. Next slide, please."

Click. The picture of the huge RT display swept away and was replaced by another similar—but visibly smaller and shabbier—construction.

"This is the Russian instrument, gentlemen. And

ladies. It is approximately one-quarter the size of ours in diameter. It has less than one-tenth as many elements, and our reports—they are classified, but I am informed this gathering is cleared to receive this material? Yes—our reports indicate the alignment is very crude. Even terrible, you could say.

"The difference between the two instruments in information-gathering capacity is roughly a hundred to one, in our favor. Lights, please.

"What this means," he went on smoothly, smiling at each of the persons around the table in turn as he spoke, "is that if the Russians say 'no' and we say 'yes', bet on 'yes.' Our radio telescope can be trusted. Theirs cannot."

The meeting shifted uneasily in its chairs. They were as anxious to believe Knefhausen as he was to convince them, but they were not sure.

Representative Belden, the Chairman of the House Ways and Means Committee, spoke for all of them. "Nobody doubts the quality of your equipment. Especially," he added, "since we still have bruises from the job of paying for it. But the Russians made a flat statement. They said that Alpha Centauri can't have a planet larger than one thousand miles in diameter, or nearer than half a billion miles to the star. I have a copy of the Tass release here. It admits that their equipment is inferior to our own, but they have a statement signed by twenty-two academicians that says their equipment could not miss on any object larger, or nearer, than what I have said, or on any body of any kind which would be large enough to afford a landing place for our astronauts. Are you familiar with this statement?"

"Yes, of course, I have read it—"

"Then you know that they state positively that the planet you call 'Alpha-Aleph' does not exist."

"Yes, sir, that is what they state."

"Moreover, statements from authorities at the Paris

Observatory and the UNESCO Astrophysical Center at Trieste, and from England's Astronomer Royal, all say that they have checked and confirmed their figures."

Knefhausen nodded cheerfully. "That is correct, Representative Belden. They confirm that if the observations are as stated, then the conclusions drawn by the Soviet installation at Novy Brezhnevgrad on Farside naturally follow. I don't question the arithmetic. I only say that the observations are made with inadequate equipment, and thus the Soviet astronomers have come to a false conclusion. But I do not want to burden your patience with an unsupported statement," he added hastily as the Congressman opened his mouth to speak again, "so I will tell you all there is to tell. What the Russians say is theory. What I have to counter is not merely better theory, but also objective fact. I know Alpha-Aleph is there because I have seen it! Lights again, Major! And the next slide, if you please."

The screen lit up and showed glaring bare white with a sprinkling of black spots, like dust. A large one appeared in the exact center of the screen, with a dozen lesser ones sprinkled around it. Knefhausen picked up a flash pointer and aimed its little arrowhead of light at the central dot.

"This is a photographic negative," he said, "which is to say that it is black where the actual scene is white and vice versa. Those objects are astronomical. It was taken from our Briareus XII satellite near the orbit of Jupiter, on its way out to Neptune fourteen months ago. The central object is the star Alpha Centauri. It was photographed with a special instrument which filters out most of the light from the star itself, electronic in nature and something like the coronascope which is used for photographing prominences on your own Sun. We hoped that by this means we might be able to photograph the planet Alpha-Aleph. We were successful, as

you can see." The flashpointer laid its little arrow next to the nearest small dot to the central star. "That, gentlemen, and ladies, is Alpha-Aleph. It is precisely, where we predicted it from radio-telescope data."

There was another buzz from the table. In the dark it was louder than before. The Secretary of State cried sharply, "Mr. President! Can't we release this photograph?"

"We will release it immediately after this meeting," said the President.

"Roobarooba."

Then the committee chairman: "Mr. President, I'm sure if you say that's the planet we want, then it's the planet. But others outside this country may wonder, for indeed all those dots look alike to me. Just to satisfy a layman's curiosity, *how* do you know that is Alpha-Aleph?"

"Slide number four, please—and keep number three in the carriage." The same scene, subtly different. "Note that in this picture, grntlemen, that one object, there, is in a different position. It has moved. You know that the stars show no discernible motion. It has moved because this photograph was taken eight months later, as Briareus XII was returning from the Neptune flyby, and the planet Alpha-Aleph has revolved in its orbit. This is not theory, it is evidence, and I add that the original tapes from which the photoprint was made are stored in Goldstone so there is no question that arises of foolishness."

"Roobarooba," but in a higher and excited key.

Gratified, Knefhausen nailed down his point. "So, Major, if you will now return to slide three, yes—and if you will flip back and forth, between three and four, as fast as you can—thank you." The little black dot called Alpha-Aleph bounced back and forth like a tennis ball, while all the other star points remained motionless.

"This is what is called the blank comparator process, you see. I point out that if what you are looking at is not a planet it is, Mr. President, the funniest star you ever saw. Also it is exactly at the distance and exactly with the orbital period we specified based on the RT data. Now, are there any more questions?"

"No, sir!" "That's great, Kneffie!" "I think that wraps it up." "That'll show the Commies."

The President's voice overrode them.

"I think we can have the lights on now, Major Merton," he said. "Dr. Knefhausen, thank you. I'd appreciate it if you would remain nearby for a few minutes, so you can join Murray and myself in the study to check over the text of our announcement before we release these pictures." He nodded sober dismissal to his chief science adviser and then, reminded by the happy faces of his cabinet, remembered to smile with pleasure.

CONSTITUTION TWO

Sheffield Jackman's log. Starship *Constitution.* Day 95.

According to Letski we are now traveling at just about fifteen percent of the speed of light, almost 30,000 miles per second. The fusion thrusters are chugging away handsomely; as predicted, the explosions sequence fast enough so that we feel them only as vibration. Fuel, power and life-support curves are sticking tight to optimum. No sweat of any kind with the ship, or, actually, with anything else.

Relativistic effects have begun to show up as predicted. Jim Barstow's spectral studies show the stars in front of us are shifting to the blue end, and the sun and other stars behind us are shifting to the red. Without the spectroscope you can't see much, though. Beta Circini looks a little funny, maybe. As for the sun, it's still very bright—Jim logged it as minus-six magnitude a few

hours ago—and as I've never seen it in quite that way before, I can't tell whether the color looks bright or not. It certainly isn't the golden yellow I associate with type GO, but neither is Alpha Centauri ahead of us, and I don't really see a difference between them. I think the reason is simply that they are so bright that the color impressions are secondary to the brightness impressions, although the spectroscope, as I say, does show the differences. We've all taken turns at looking back. Naturally enough, I guess. We can still make out the Earth and even the moon in the telescope, but it's chancy. Ski almost got an eyeful of the sun at full light-gathering amplitude yesterday because the visual separation is only about twelve seconds of arc now. In a few more days they'll be too close to separate.

Let's see, what else?

We've been having a fine time with the recreational math program. Ann has taken to binary arithmetic like a duck to water. She's involved in what I take to be some sort of statistical experimentation—we don't pry too much into what the others are doing until they're ready to talk about it—and, of all things, she demanded we produce coins to flip. Well, naturally none of us had taken any money with us! Except that it turns out two of us did. Ski had a Russian silver ruble that his mother's uncle had given him for luck, and I found an old Philadelphia transit token in my pocket. Ann rejected my transit token as too light to be reliable, but she now spends happy hours flipping the ruble, heads or tails, and writing down the results as a series of six-place binary numbers, 1 for heads and 0 for tails. After about a week my curiosity got too much so I began hinting to find out what she was doing. When I ask she says things like, "By means of the easy and the simple we grasp the laws of the whole world." When I say that's nice, but what does she hope to grasp by flipping the coin, she

says, "When the laws of the whole world are grasped, therein lies perfection." So, as I say, we don't press each other and I leave it there. But it passes the time.

Kneffie would be proud of himself if he could see how our recreation keeps us busy. None of us has managed to prove Fermat's Last Theorem yet or anything like that, but of course that's the whole point. If we could *solve* the problems, we'd have used them up, and then what would we do for recreation? It does exactly what it was intended to. It keeps us mentally alert on this long and intrinsically rather dull boat ride.

Personal relationships? Jes' fine, fellows, jes' fine. A lot better than any of us really hoped, back there at the personal-hygiene briefings in Mission Control. The girls take the stripey pills every day until three days before their periods, then they take the green pills for four days, then they lay off pills for four days, then back to the stripes. There was a little embarrassed joking about it at first, but now it's strictly routine, like brushing our teeth. We men take our red pills every day—Ski christened them "stop lights"—until the girls tell us they're about to lay off—you know what I mean, each girl tells her husband—then we take the Blue Devil—that's what we call the antidote—and have a hell of a time until the girls start on the stripes again. None of us thought any of this would work, you know. But it works fine. I don't even think sex until Flo kisses my ear and tells me she's getting ready to, excuse the expression, get in heat, and then like wow. Same with everybody. The aft chamber with the nice wide bunks we call Honeymoon Hotel. It belongs to whoever needs it, and never once have both bunks been used. The rest of the time we just sleep wherever is convenient, and nobody gets uptight about it.

Excuse my getting personal, but you told me you wanted to know everything, and there's not much else

to tell. All systems remain optimum. We check them over now and again, but nothing has given any trouble, or even looked as though it might be thinking about giving trouble later on. And there's absolutely nothing worth looking at outside, but stars. We've all seen them about as much as we need to by now. The plasma jet thrums right along at our point-seven-five G. We don't even hear it any more.

We've got used to the recycling system. None of us really thought we'd get with the suction toilet, not to mention what happens to the contents, but it was only a little annoying the first few days. Now it's fine. The treated product goes into the algae tanks. The sludge from the algae goes into the hydroponic beds, but by then, of course, it's just greeny-brown vegetable matter. That's all handled semiautomatically anyway, of course, so our first real contact with the system comes in the kitchen.

The food we eat comes in the form of nice red tomatoes and nourishing rice pilaf and stuff like that. (We do miss animal protein a little; the frozen stores have to last a long time, so each hamburger is a special feast and we only have them once a week or so.) The water we drink comes actually out of the air, condensed by the dehumidifiers into the reserve supply, where we get it to drink. It's nicely aerated and chilled and tastes fine. Of course, the way it gets into the air in the first place is by being sweated out of our pores or transpired from the plants—which are irrigated direct from the treated product of the reclamation tanks—and we all know, when we stop to think of it, that every molecule of it has passed through all our kidneys forty times by now. But not directly. That's the point. What we drink is clear sweet dew. And if it once was something else, can't you say the same of Lake Erie?

"Well, I think I've gone on long enough. You've prob-

ably got the idea by now: we're happy in the service, and we all thank you for giving us this pleasure cruise!

WASHINGTON TWO

Waiting for his appointment with the President, Dr. Knefhausen reread the communique from the spaceship, chuckling happily to himself. "Happy in the service." "Like wow." "Kneffie would be proud of himself." Indeed Kneffie was. And proud of them, those little wonders, there! So brave. So strong.

He took as much pride in them as though they had been his own sons and daughters, all eight of them. Everybody knew the Alpha-Aleph project was Knefhausen's baby, but he tried to conceal from the world that, in his own mind, he spread his fatherhood to include the crew. They were the pick of the available world, and it was he who had put them where they were. He lifted his head, listening to the distant chanting from the perimeter fence where today's disgusting exhibition of mob violence was doing its best to harass the people who were making the world go. What great lumps they were out there, with their long hair and their dirty morals. The heavens belonged only to angels, and it was Dieter von Knefhausen who had picked the angels. It was he who had established the selection procedures—and if he had done some things that were better left unmentioned to make sure the procedures worked, what of it? It was he who had conceived and adapted the highly important recreation schedule, and above all he who had conceived the entire project and persuaded the President to make it come true. The hardware was nothing, only money. The basic scientific concepts were known; most of the components were on the shelves; it took only will to put them together. The will would not have existed if it had not been for

Knefhausen, who announced the discovery of Alpha-Aleph from his radio observatory on Farside—gave it that name, although as everyone realized he could have called it by any name he chose, even his own—and carried on the fight for the project by every means until the President bought it.

It had been a hard, bitter struggle. He reminded himself with courage that the worst was still ahead. No matter. Whatever it cost, it was done, and it was worthwhile. These reports from *Constitution* proved it. It was going exactly as planned, and—

"Excuse me, Dr. Knefhausen."

He looked up, catapulted back from almost half a light-year away.

"I said the President will see you now, Dr. Knefhausen," repeated the usher.

"Ah," said Knefhausen. "Oh, yes, to be sure. I was deep in thought."

"Yes, sir. This way, sir."

They passed a window and there was a quick glimpse of the turmoil at the gates, picket signs used like battle-axes, a thin blue cloud of tear gas, the sounds of shouting. "King Mob is busy today," said Knefhausen absently.

"There's no danger, sir. Through here, please."

The President was in his private study, but to Knefhausen's surprise he was not alone. There was Murray Amos, his personal secretary, which one could understand; but there were three other men in the room. Knefhausen recognized them as the Secretary of State, the Speaker of the House and, of all people, the Vice President. How strange, thought Knefhausen, for what was to have been a confidential briefing for the President alone! But he rallied quickly.

"Excuse me, Mr. President," he said cheerfully, "I

must have understood wrong. I thought you were ready for our little talk."

"I am ready, Knefhausen," said the President. The cares of his years in the White House rested heavily on him today, Knefhausen thought critically. He looked very old and very tired. "You will tell these gentlemen what you would have told me."

"Ah, yes, I see," said Knefhausen, trying to conceal the fact that he did not see at all. Surely the President did not mean what his words said, therefore it was necessary to try to see what was his thought. "Yes, to be sure. Here is something, Mr. President. A new report from the *Constitution!* It was received by burst transmission from the Lunar Orbiter at Goldstone just an hour ago, and has just come from the decoding room. Let me read it to you. Our brave astronauts are getting along splendidly, just as we planned. They say—"

"Don't read us that just now," said the President harshly. "We'll hear it, but first there is something else. I want you to tell this group the full story of the Alpha-Aleph project."

"The full story, Mr. President?" Knefhausen hung on gamely. "I see. You wish me to begin with the very beginning, when first we realized at the observatory that we had located a planet—"

"No, Knefhausen. Not the cover story. The truth."

"Mr. President!" cried Knefhausen in sudden agony. "I must inform you that I protest this premature disclosure of vital—"

"The truth, Knefhausen!" shouted the President. It was the first time Knefhausen had ever heard him raise his voice. "It won't go out of this room, but you must tell them everything. Tell them why it is that the Russians were right and we lied! Tell them why we sent the astronauts on a suicide mission, ordered to land on a planet that we knew all along did not exist!"

Shef Jackman's journal, Day 130.

It's been a long time, hasn't it? I'm sorry for being such a lousy correspondent. I was in the middle of a thirteen-game chess series with Eve Barstow—she was playing the Bobby Fischer games and I was playing in the style of Reshevsky—and Eve said something that made me think of old Kneffie, and that, of course, reminded me I owed you a transmission. So here it is.

In my own defense, though, it isn't only that we've been busy with other things. It takes a lot of power for these chatty little letters. Some of us aren't so sure they're worthwhile. The farther we get the more power we need to accumulate for a transmission. Right now it's not so bad, but, well, I might as well tell you the truth, right? Kneffie made us promise that. Always tell the truth, he said, because you're part of the experiment, and we need to know what you're doing, all of it. Well, the truth in this case is that we were a little short of disposable power for a while because Jim Barstow needed quite a lot for research purposes. You will probably wonder what the research is, but we have a rule that we don't criticize, or even talk about, what anyone else is doing until they're ready, and he isn't ready yet. I take the responsibility for the whole thing, not just the power drain but the damage to the ship. I said he could go ahead with it.

We're going pretty fast now, and to the naked eye the stars fore and aft have blue-shifted and red-shifted nearly out of sight. It's funny but we haven't been able to observe Alpha-Aleph yet, even with the disk obscuring the star. Now, with the shift to the blue, we probably won't see it at all until we slow down. We can still see the sun, but I guess what we're seeing is ultraviolet when it's home. Of course the relativistic frequency shifts mean we need extra compensating power in our

transmissions, which is another reason why, all in all, I don't think I'll be writing home every Sunday between breakfast and the baseball game, the way I ought to!

But the mission's going along fine. The "personal relationships" keep on being just great. We've done a little experimental research there, too, that wasn't on the program, but it's all O.K. No problems. Worked out great. I think maybe I'll leave out some of the details, but we found some groovy ways to do things. Oh, hell, I'll give you one hint: Dot Letski says I should tell you to get the boys at Mission Control to crack open two of the stripey pills and one of the Blue Devils, mix them with a quarter-teaspoon of black pepper and about 2 cc of the conditioner fluid from the recycling system. Serve over orange sherbet, and oh, boy. After the first time we had it Flo made a crack about its being "seminal," which I thought was a private joke, but it broke everybody up. Dot figured it out for herself weeks ago. We wondered how she got so far so fast with "War and Peace" until she let us into the secret. Then we found out what it could do for you, both emotionally and intellectually: the creative over the arousing, as they say.

Ann and Jerry Letski used up their own recreational programs early—real early. They were supposed to last the whole voyage! They swapped microfiches, on the grounds that each was interested in an aspect of causality and they wanted to see what the other side had to offer. Now Ann is deep into people like Kant and Carnap, and Ski is sore as a boil because there's no *Achillea millefolium* in the hydrophonics garden. Needs the stalks for his researches, he says. He is making do with flipping his ruble to generate hexagrams; in fact we all borrow it now and then. But it's not the right way. Honestly, Mission Control, he's right. Some thought should have been given to our other needs, besides sex and number theory. We can't even use chop bones from

the kitchen wastes, because there isn't any kitchen waste. I know you couldn't think of everything, but still —anyway, we improvise as best we can, and mostly well enough.

Let's see, what else? Did I send you Jim Barstow's proof of Goldbach's Conjecture? Turned out to be very simple once he had devised his multiplex parity analysis idea. Mostly we don't fool with that sort of stuff any more, though. We got tired of number theory after we'd worked out all the fun parts, and if there is any one thing that we all work on—apart from our private interests—it is probably the calculus of statement. We don't do it systematically, only as time permits from our other activities, but we're all pretty well convinced that a universal grammar is feasible enough, and it's easy enough to see where that leads.

Flo has done more than most of us. She asked me to put in that Boole, Venn and all those old people were on the wrong track, but she thinks there might be something to Leibniz's "calculus ratiocinator" idea. There's a J. W. Swanson suggestion that she likes for multiplexing languages. (Jim took off from it to work out his parity analysis.) The idea is that you devise a double-vocabulary language. One set of meanings is conveyed, say, by phonemes, that is, the shape of the words themselves. Another set is conveyed by pitch. It's like singing a message, half of it conveyed by the words, the other half by the tune—like rock music. You get both sets of meanings on third, fourth and nth dimensions so as to convey many kinds of meanings at once, but it's not very fruitful so far—except for using sex as one of the communications media. Most of the senses available are too limited to convey much.

By the way, we checked out all the existing "artificial languages" as best we could—put Will Becklund under hypnotic regression to recapture the Esperanto he'd

learned as a kid, for instance. But they were all blind alleys. Didn't even convey as much as standard English or French.

Medical readouts follow. We're all healthy. Eve Barstow gave us a medical check to make sure. Ann and Ski had little rough spots in a couple of molars so she filled them for the practice more than because they needed it. I don't mean practice in filling teeth; she wanted to try acupuncture instead of procaine. Worked fine.

We all have this writing-to-Daddy-and-Mommy-from-Camp-Tanglewood feeling and we'd like to send you some samples of our home handicrafts. The trouble is there's so much of it. Everybody has something he's personally pleased with, like Barstow's proof of most of the classic math problems and my multi-media adaptation of *"Sur le pont d'Avignon."* It's hard to decide what to send you with the limited power available, and we don't want to waste it with junk. So we took a vote and decided the best thing was Ann's verse retelling of "War and Peace". It runs pretty long. I hope the power holds it. I'll transmit as much of it as I can. . . .

WASHINGTON THREE

Spring was well advanced in Washington. Along the Potomac the cherry blossoms were beginning to bud, and Rock Creek Park was the pale green of new leaves. Even through the *whap, whap* of the helicopter rotor Knefhausen could hear an occasional rattle of small-arms fire from around Georgetown, and the Molotov cocktails and tear gas from the big Water Gate apartment development at the river's edge were steaming up the sky with smoke and fumes. They never stopped, thought Knefhausen irritably. What was the good of trying to save people like this?

It was distracting. He found himself dividing his at-

tention into three parts—the scarred, greening landscape below; the escort fireships that orbited around his own chopper; and the papers on his lap. All of them annoyed him. He couldn't keep his mind on any of them. What he liked least was the report from the *Constitution.* He had had to get expert help in translating what it was all about, and didn't like the need, and even less liked the results. What had gone wrong? They were his kids, hand-picked. There had been no hint of, for instance, hippiness in any of them, at least not past the age of twenty, and only for Ann Becklund and Florence Jackman even then. How had they got into this *I Ching* foolishness, and this stupid business with the *Achillea millefolium,* better known as the common yarrow? What "experiments"? Who started the disgustingly antiscientific acupuncture thing? How dared they depart from their programmed power budget for "research purposes," and what were the purposes? Above all, what was the "damage to the ship"?

He scribbled on a pad:

> With immediate effect, cut out the nonsense. I have the impression you are all acting like irresponsible children. You are letting down the ideals of our program.
>
> Knefhausen

After running the short distance from the chopper pad to the shelter of the guarded White House entrance, he gave the slip to a page from the Message Center for immediate encoding and transmission to the *Constitution* via Goldstone, Lunar Orbiter and Farside Base. All they needed was a reminder, he persuaded himself, then they would settle down. But he was still worried as he peered into a mirror, patted his hair down, smoothed his moustache with the tip of a finger and presented himself to the President's chief secretary.

This time they went down, not up. Knefhausen was

going to the basement chamber that had been successively Franklin Roosevelt's swimming pool, the White House press lounge, a TV studio for taping jolly little two-shots of the President with congressmen and senators for the folks back home to see and, now, the heavily armored bunker in which anyone trapped in the White House in the event of a successful attack from the city outside could hold out for several weeks, during which time the Fourth Armored would surely be able to retake the grounds from its bases in Maryland. It was not a comfortable room, but it was a safe one. Besides being armored against attack, it was as thoroughly soundproof, spyproof and leakproof as any chamber in the world, not excepting the Under-Kremlin, or the Colorado NOROM base.

Knefhausen was admitted and seated, while the President and a couple of others were in whispered conversation at one end of the room, and the several dozen other people present craned their necks to stare at Knefhausen.

After a moment the President raised his head. "All right," he said. He drank from a crystal goblet of water, looking wizened and weary, and disappointed at the way a boyhood dream had turned out: the presidency wasn't what it had seemed to be, from Muncie, Indiana. "We all know why we're here. The government of the United States has given out information which was untrue. It did so knowingly and wittingly, and we've been caught at it. Now we want you to know the background, and so Dr. Knefhausen is going to explain the Alpha-Aleph project. Go ahead, Knefhausen."

Knefhausen stood up and walked unhurryingly to the little lectern set up for him, off to one side of the President. He opened his papers on the lectern, studied them thoughtfully for a moment with his lips pursed and said:

"As the President has said, the Alpha-Aleph project is a camouflage. A few of you learned this some months ago, and then you referred to it with other words. 'Fraud.' 'Fake.' Words like that. But if I may say it in French, it is not any of those words, it is a legitimate *ruse de guerre*. Not the *guerre* against our political enemies, or even against the dumb kids in the streets with their Molotov cocktails and bricks. I do not mean those wars, I mean the war against ignorance. For you see, there were certain signs—certain *things*—we had to know for the sake of science and progress. Alpha-Aleph was designed to find them out for us.

"I will tell you the worst parts first," he said. "Number one, there is no such planet as Alpha-Aleph. The Russians were right. Number two, we knew this all along. Even the photographs were fakes, and in the long run the rest of the world will find this out and they will know of our *ruse de guerre*. I can only hope that they will not find out too soon, for if we are lucky and keep the secret for a while, then I hope we will be able to produce good results to justify what we have done. Number three, when the *Constitution* reaches Alpha Centauri there will be no place for them to land, no way to leave their spacecraft, no sources of raw materials which they might be able to use to make fuel to return —nothing but the stars and empty space. This fact has certain consequences.

"The *Constitution* was designed with enough hydrogen fuel capacity for a one-way flight, plus maneuvering reserve. There will not be enough for them to come back, and the source they had hoped to tap, namely the planet Alpha-Aleph, does not exist, so they will not come back. Consequently they will die there. Those are the bad things to which I must admit."

There was a sighing murmur from the audience. The President was frowning absently to himself. Knef-

hausen waited patiently for the medicine to be swallowed, then went on.

"You ask, then, why have we done this thing? Condemning eight young people to their death? The answer is simple: knowledge. To put it in other words, we must have the basic scientific knowledge to protect the free world. You are all familiar, I si . . . I believe, with the known fact that basic scientific advances have been very few these past ten years and more. Much R&D. Much technology. Much applications. But in the years since Einstein, or better since Weizsäcker, very little basic.

"But without the new basic knowledge, the new technology must soon stop developing. It will run out of steam, you see.

"Now I must tell you a story. It is a true scientific story, not a joke; I know you do not want jokes from me at this time. There was a man named de Bono, a Maltese, who wished to investigate the process of creative thinking. There is not very much known about this process, but he had an idea how he could find something out. So he prepared for an experiment a room that was stripped of all furniture, with two doors, one across from the other. You go in one door, cross the room and then you walk out the other. He put at the door that was the entrance some material—two flat boards, some ropes. And he got as his subjects some young children. Now he said to the children: 'This is a game we will play. You must go through this room and out the other door, that is all. If you do that, you win. But there is one rule. You must not touch the floor with your feet, or your knees, or with any part of your body, or your clothing. We had here a boy,' he said, 'who was very athletic and walked across on his hands, but he was disqualified. You must not do that. Now go, and whoever does it fastest will win some chocolates.'

"So he took away all of the children but the first one

and, one by one, they tried. There were ten or fifteen of them, and each of them did the same thing. Some it took longer to figure it out, some figured it out right away, but it always was the same trick: they sat down on the floor, they tied one board to each foot and they walked across the room like on skis. The fastest one thought of the trick right away and was across in a few seconds. The slowest took many minutes. But it was the same trick for all of them, and that was the first part of the experiment.

"Now this Maltese man, de Bono, performed the second part of the experiment. It was exactly like the first, with one difference. He did not give them two boards. He gave them only one board.

"And in the second part every child worked out the same trick, too, but it was, of course, a different trick. They tied the rope to the end of the single board and then they stood on it, and jumped up, tugging the rope to pull the board forward, hopping and tugging, moving a little bit at a time, and every one of them succeeded. But in the first experiment the average time to cross was maybe forty-five seconds. And in the second experiment the average time was maybe twenty seconds. With one board they did their job faster than with two.

"Perhaps now some of you see the point. Why did not any of the children in the first group think of this faster method of going across the room? It is simple. They looked at what they were given to use for materials and, they are like all of us, they wanted to use everything. But they did not need everything. They could do better with less, in a different way."

Knefhausen paused and looked around the room, savoring the moment. He had them now, he knew. It was just as it had been with the President himself, three years before. They were beginning to see the necessity of what had been done, and the pale, upturned

faces were no longer as hostile, only perplexed and a little afraid.

He went on:

"So that is what Project Alpha-Aleph is about, gentlemen and ladies. We have selected eight of the most intelligent human beings we could find, healthy, young, very adventurous. Very creative. We played on them a nasty trick, to be sure. But we gave them an opportunity no one has ever had. The opportunity to *think*. To think for *ten years*. To think about basic questions. Out there they do not have the extra board to distract them. If they want to know something they cannot run to the library and look it up, and find that somebody has said that what they were thinking could not work. They must think it out for themselves.

"So in order to make this possible we have practiced a deception on them and it will cost them their lives. All right, that is tragic, yes. But if we take their lives we give them in exchange immortality.

"How do we do this? Trickery again, gentlemen and ladies. I do not say to them, 'Here, you must discover new basic approaches to science and tell them to us.' I camouflage the purpose, so that they will not be distracted even by that. We have told them that this is recreational, to help them pass the time. This, too is a *ruse de guerre*. The 'recreation' is not to help them make the trip, it is the whole purpose of the trip.

"So we start them out with the basic tools of science. With numbers: that is, with magnitudes and quantification, with all that scientific observations are about. With grammar. This is not what you learned when you were thirteen years old. It is a technical term; it means the calculus of statement and the basic rules of communication—that is, so they can learn to think clearly by communicating fully and without fuzzy ambiguity. We give them very little else, only the opportunity to mix

these two basic ingredients and come up with new forms of knowledge.

"What will come of these things? That is a fair question. Unfortunately there is no answer—not yet. If we knew the answer in advance, we would not have to perform the experiment. So we do not know what will be the end result of this, but already they have accomplished very much. Old questions that have puzzled the wisest of scientists for hundreds of years they have solved already. I will give you one example. You will say, yes, but what does it *mean?* I will answer, I do not know, I only know that it is so hard a question that no one else has ever been able to answer it. It is a proof of a thing which is called Goldbach's Conjecture. Only a conjecture; you could call it a guess. A guess by an eminent mathematician many, many years ago, that every even number can be written as the sum of two prime numbers. This is one of those simple problems in mathematics that everyone can understand and no one can solve. You can say, 'Certainly, sixteen is the sum of eleven and five, both of which are prime numbers, and thirty is the sum of twenty-three and seven, which also are both prime, and I can give you such numbers for any even number you care to name.' Yes, you can; but can you prove that for *every* even number it will *always* be possible to do this? No. You cannot. No one has been able to, but our friends on the *Constitution* have done it, and this was in the first few months. They have yet almost ten years. I cannot say what they will do in that time, but it is foolish to imagine that it will be anything less than very much indeed. A new relativity, a new universal gravitation—I don't know, I am only saying words. But much."

He paused again. No one was making a sound. Even the President was no longer staring straight ahead without expression, but was looking at him.

"It is not yet too late to spoil the experiment, and so it is necessary for us to keep the secret a bit longer. But there you have it, gentlemen and ladies. That is the truth about Alpha-Aleph." He dreaded what would come next, postponed it for a second by consulting his papers, shrugged, faced them and said: "Now, are there any questions?"

Oh, yes, there were questions. *Herr Omnes* was stunned a little, took a moment to overcome the spell of the simple and beautiful truths he had heard, but first one piped up, then another, then two or three shouting at once. There were questions, to be sure. Questions beyond answering. Questions he did not have time to hear, much less answer, before the next question was on him. Questions to which he did not know the answers. Questions, worst of all, to which the answers were like pepper in the eyes, enraging, blinding the people to sense. But he had to face them, and he tried to answer them. Even when they shouted so that outside the thick double doors the Marine guards looked at each other uneasily, and wondered what made the dull rumble that penetrated the very good soundproofing of the room. "What I want to know, who put you up to this?" "Mr. Chairman, nobody; it is as I have said." "But see now, Knefhausen, do you mean to tell us you're murderin' these good people for the sake of some Goldbach's theory?" "No, Senator, not for Goldbach's Conjecture, but for what great advances in science will mean in the struggle to keep the free world free." "You're confessing you've dragged the United States into a palpable fraud?" "A legitimate ruse of war, Mr. Secretary, because there was no other way." "The photographs, Knefhausen?" "Faked, General, as I have told you. I accept full responsibility." And on and on, the words "murder" and "fraud" and even "treason" coming faster and faster.

Until at last the President stood up and raised his hand. Order was a long time coming, but at last they quieted down.

"Whether we like it or not, we're in it," he said simply. "There is nothing else to say. You have come to me, many of you, with rumors and asked for the truth. Now you have the truth, and it is classified Top Secret and must not be divulged. You all know what this means. I will only add that I personally propose to see that any breach of this security is investigated with all the resources of the government, and punished with the full penalty of the law. I declare this a matter of national emergency, and remind you that the penalty includes the death sentence when appropriate—and I say that in this case it is appropriate." He looked very much older than his years, and he moved his lips as though something tasted bad in his mouth. He allowed no further discussion, and dismissed the meeting.

Half an hour later, in his private office, it was just Knefhausen and the President.

"All right," said the President, "it's all hit the fan. The next thing is the world will know it. I can postpone that a few weeks, maybe even months. I can't prevent it."

"I am grateful to you, Mr. President, for—"

"Shut up, Knefhausen. I don't want any speeches. There is one thing I want from you, and that is an explanation: what the hell is this about mixing up narcotics and free love and so on?"

"Ah," said Knefhausen, "you refer to the most recent communication from the *Constitution*. Yes. I have already dispatched, Mr. President, a strongly worded order. Because of the communications lag it will not be received for some months, but I assure you the matter will be corrected."

The President said bitterly, "I don't want any as-

surances, either. Do you watch television? I don't mean 'I Love Lucy' and ball games, I mean news. Do you know what sort of shape this country is in? The bonus marches in 1932, the race riots in 1967—they were nothing. Time was when we could call out the National Guard to put down disorder. Last week I had to call out the Army to use against three companies of the Guard. One more scandal and we're finished, Knefhausen, and this is a big one."

"The purposes are beyond reproach—"

"Your purposes may be. Mine may be, or I try to tell myself it is for the good of science I did this, and not so I will be in the history books as the president who contributed a major breakthrough. But what are the purposes of your friends on the *Constitution*? I agreed to eight martyrs, Knefhausen. I didn't agree to forty billion dollars out of the nation's pockets to give your eight young friends ten years of gang-bangs and dope."

"Mr. President, I assure you this is only a temporary phase. I have instructed them to straighten out."

"And if they don't, what are you going to do about it?" The President, who never smoked, stripped a cigar, bit off the end and lit it. He said, "It's too late for me to say I shouldn't have let you talk me into this. So all I will say is you have to show results from this flimflam before the lid blows off, or I won't be President any more, and I doubt that you will be alive."

CONSTITUTION FOUR

This is Shef again and it's, oh, let me see, about Day 250. 300? No, I don't think so. Look, I'm sorry about the ship date, but I honestly don't think much in those terms any more. I've been thinking about other things. Also I'm a little upset. When I tossed the ruble the hexagram was K'an, which is danger, over Li, the Sun. That's a bad mood in which to be communicating with

you. We aren't vengeful types, but the fact is that some of us were pretty sore when we found out what you'd done. I don't *think* you need to worry, but I wish I'd got a much better hexagram.

Let me tell you the good parts first. Our velocity is pushing point-four-oh c now. The scenery is beginning to get interesting. For several weeks the stars fore and aft have been drifting out of sight as the ones in front get up into the ultraviolet and the ones behind sink into the infrared. You'd think that as the spectrum shifts the other parts of the EMF bands would come into the visible range. I guess they do, but stars peak in certain frequencies, and most of them seem to do it in the visible frequencies, so the effect is that they disappear. The first thing was that there was a sort of round black spot ahead of us where we couldn't see anything at all, not Alpha Centauri, not Beta Centauri, not even the bright Circini stars. Then we lost the sun behind us, and a little later we saw the blackout spread to a growing circle of stars there. Then the circles began to widen.

Of course, we know that the stars are really there. We can detect them with phase-shift equipment, just as we can transmit and receive your messages by shifting the frequencies. But we just can't see them any more. The ones in direct line of flight, where we have a vector velocity of .34c or .37c—depending on whether they are in front of us or behind us—simply aren't radiating in the visible band any more. The ones farther out to the side have been displaced visually because of the relativistic effects of our speed. But what it looks like is that we're running the hell out of Nothing, in the direction of Nothing, and it is frankly a little scary.

Even the stars off to one side are showing relativistic color shifts. It's almost like a rainbow, one of those full-circle rainbows that you see on the clouds beneath

you from an airplane sometimes. Only this circle is all around us. Nearest the black hole in front the stars have frequency-shifted to a dull reddish color. They go through orange and yellow and a sort of leaf green to the band nearest the black hole in back, which are bright blue shading to purple. Jim Barstow has been practicing his farsight on them, and he can relate them to the actual sky map. But I can't. He sees something in the black hole in front of us that I can't see. He says he thinks it's a bright radio source, probably Centaurus A, and he claims it is radiating strongly in the whole visible band now. He means strongly for him, with his eyes. I'm not sure I can see it at all. There *may* be a sort of very faint, diffuse glow there, like the *Gegenschein*, but I'm not sure. Neither is anyone else.

But the starbow itself is beautiful. It's worth the trip. Flo has been learning oil painting so she can make a picture of it to send you for your wall, although when she found out what you'd been up to she got so sore she was thinking of boobytrapping it with a fusion bomb or something. (But she's over that now. I think.)

So we're not so mad at you any more, although there was a time when if I'd been communicating with you at exactly that moment I would have said some bad things.

I just played this back, and it sounds pretty jumbled and confused. I'm sorry about that. It's hard for me to do this. I don't mean hard like intellectually difficult —the way chess problems and tensor analysis used to be—but hard like shoveling sand with a teaspoon. I'm just not used to constricting my thoughts in this straitjacket any more. I tried to get one of the others to communicate this time, but there were no takers. I did get a lot of free advice. Dot says I shouldn't waste my time remembering how we used to talk. She wanted to write an eidetic account in simplified notation for

you, which she estimated a crash program could translate for you in reasonable time, a decade or two, and would give you an absolutely full account of everything. I objected that that involved practical difficulties. Not in preparing the account . . . shucks, we can all do that now. I don't forget anything, except irrelevant things like the standard-reckoning day that I don't want to remember in the first place, and neither does anyone else. But the length of transmission would be too much. We don't have the power to transmit the necessary number of groups, especially since the accident. Dot said we could Gödelize it. I said you were too dumb to de-Gödelize it. She said it would be very good practice for you.

Well, she's right about that, and it's time you all learned how to communicate in a sensible way, so if the power holds out I'll include Dot's eidetic account at the end—in Gödelized form. Lots of luck. I won't honestly be surprised if you miss a digit or something and it all turns into "Rebecca of Sunnybrook Farm" or some missing books of apocrypha or, more likely of course, gibberish. Ski says it won't do you any good in any case, because Henle was right. I pass that on without comment.

Sex. You always want to hear about sex. It's great. Now that we don't have to fool with the pills any more we've been having some marvelous times. Flo and Jim Barstow began making it as part of a multiplexed communications system that you have to see to believe. Sometimes when they're going to do it we all knock off and just sit around and watch them, cracking jokes and singing and helping with the auxiliary computations. When we had that little bit of minor surgery the other day—now we've got the bones seasoning—Ann and Ski decided to ball instead of using anesthesia, and they said it was better than acupuncture. It didn't block the

sensation. They were aware of their little toes being lopped off, but they didn't perceive it as pain. So then Jim, when it was his turn, tried going through the amputation without anything at all in the expectation that he and Flo would go to bed together a little later, and that worked well too. He was all set up about it; claimed it showed a reverse causalty that his theories predicted but that had not been demonstrated before. Said at last he was over the cause-preceding-the-effect hangup. It's like the Red Queen and the White Queen, and quite puzzling until you get the hang of it. (I'm not sure I've got the hang of it yet.) Suppose he hadn't balled Flo? Would his toe have hurt retroactively? I'm a little mixed up on this, Dot says because I simply don't understand phenomenology in general, and I think I'll have to take Ann's advice and work my way through Carnap, although the linguistics are so poor that it's hard to stay with it. Come to think of it, I don't have to. It's all in the Gödelized eidetic statement, after all. So I'll transmit the statement to you, and while I'm doing it that will be a sort of review for me and maybe I'll get my head right on causality.

Listen, let me give you a tip. The statement will also include Ski's trick of containing plasma for up to 500K milliseconds, so when you figure it out you'll know how to build those fusion power reactors you were talking about when we left. That's the carrot before your nose, so get busy on de-Gödelizing. The plasma dodge works fine, although, of course, we were sorry about what happened when we junked those dumb Rube Goldberg bombs you had going off and replaced them with a nice steady plasma flow. The explosion killed Will Becklund outright, and it looked hairy for all of us.

Well, anyway. I have to cut this short because the power's running a little low and I don't want to chance

messing up the statement. It follows herewith:

$1973 + 331^{852} + 17^{2008} + 5^{47} + 3^{9606} + 2^{88}$ take away 78.

Lots of luck, fellows!

WASHINGTON FOUR

Knefhausen lifted his head from the litter of papers on his desk. He rubbed his eyes, sighing. He had given up smoking the same time as the President, but, like the President, he was thinking of taking it up again. It could kill you, yes. But it was a tension-reducer, and he needed that. And what was wrong with something killing you. There were worse things than being killed, he thought dismally.

Looking at it any way you could, he thought objectively, the past two or three years had been hard on him. They had started so well and had gone so bad. Not as bad as those distant memories of childhood when everybody was so poor and Berlin was so cold and what warm clothes he had came from the *Winterhilfe*. By no means as hard as the end of the war. Nothing like as bad as those first years in South America and then in the Middle East, when even the lucky and famous ones, the Von Brauns and the Ehrickes, were having trouble getting what was due them and a young calf like Knefhausen had to peel potatoes and run elevators to live. But harder and worse than a man at the summit of his career had any reason to expect.

The Alpha-Aleph project, fundamentally, was sound! He ground his teeth, thinking about it. It would work—no, by God, it *was* working, and it would make the world a different place. Future generations would see.

But the future generations were not here yet, and in the present things were going badly.

Reminded, he picked up the phone and buzzed his secretary. "Have you got through to the President yet?" he demanded.

"I'm sorry, Dr. Knefhausen. I've tried every ten minutes, just as you said."

"Ah," he grunted. "No, wait. Let me see. What calls are there?"

Rustle of paper. "The news services, of course, asking about the rumors again. Jack Anderson's office. The man from CBS."

"No, no. I will not talk to the press. Anyone else?"

"Sentaor Copley called, asking when you were going to answer the list of questions his committee sent you."

"I will give him an answer. I will give him the answer Götz von Berlichingen gave to the Bishop of Bamberg."

"I'm sorry, Dr. Knefhausen, I didn't quite catch—"

"No matter. Anything else?"

"Just a long-distance call from a Mr. Hauptmann. I have his number."

"Hauptmann?" The name was puzzlingly familiar. After a moment Knefhausen placed it: to be sure, the photo technician who had cooperated in the faked pictures from Briareus XII. Well, he had his orders to stay out of sight and shut up. "No, that's not important. None of them are, and I do not wish to be disturbed with such nonsense. Continue as you were, Mrs. Ambrose. If the President is reached you are to put me on at once, but no other calls."

He hung up and turned to his desk.

He looked sadly and fondly at the papers. He had them all out: the reports from the *Constitution*, his own drafts of interpretation and comment, and more than a hundred footnoted items compiled by his staff, to help untangle the meanings and implications of those ah, sometimes so cryptic reports from space:

"*Henle*. Apparently refers to Paul Henle (not appended); probably the citation intended is his statement, 'There are certain symbolisms in which certain

things cannot be said.' Conjecture that English language is one of those symbolisms."

"*Orange sherbet sundae.* A classified experimental study was made of the material in Document Ref. No. CON-130, Para. 4. Chemical analysis and experimental testing have indicated that the recommended mixture of pharmaceuticals and other ingredients produce a hallucinogen-related substance of considerable strength and not wholly known qualities. One hundred subjects ingested the product or a placebo in a double-blind controlled test. Subjects receiving the actual substance report reactions significantly different from the placebo. Effects reported include feelings of immense competence and deepened understanding. However, data is entirely subjective. Attempts were made to verify claims by standard I.Q., manipulative and other tests, but the subjects did not cooperate well and several have since absented themselves without leave from the testing establishment."

"*Gödelized language.* A system of encoding any message of any kind as a single very large number. The message is first written out in clear language and then encoded as bases and exponents. Each letter of the message is represented in order by the natural order of primes—that is, the first letter is represented by the base 2, the second by the base 3, the third by the base 5, then 7, 11, 13, 17, etcetera. The identity of the letter occupying that position in the message is given by the exponent: simply, the exponent 1 meaning that the letter in that position is an A, the letter 2 meaning that it is a B, 3 a C, etcetera. The message, as a whole, is then rendered as the product of all the bases and exponents. *Example.* The word "cab" can thus be represented as $2^3 \times 3^1 \times 5^2$, or 600. ($= 8 \times 3 \times 25$.) The name 'Abe' would be represented by the number 56,250, or $2^1 \times 3^2 \times 5^5$. ($= 2 \times 9 \times 3125$.) A sentence like 'John

lives' would be represented by the product of the following terms: $2^{10} \times 3^{15} \times 5^{8} \times 7^{14} \times 11^{0} \times 13^{12} \times 17^{9} \times 19^{22} \times 23^{5} \times 29^{19} \times 31^{27}$—in which the exponent '0' has been reserved for a space and the exponent '27' has been arbitrarily assigned to indicate a full stop. As can be seen, the Gödelized form for even a short message involves a very large number, although such numbers may be transmitted quite compactly in the form of a sum of bases and exponents. The example transmitted by the *Constitution* is estimated to equal the contents of a standard unabridged dictionary."

"*Farsight.* The subject James Madison Barstow is known to have suffered from some nearsightedness in his early school years, apparently brought on by excessive reading, which he attempted to cure through eye exercises similar to the 'Bates method'—note appended. His vision at time of testing for Alpha-Aleph project was optimal. Interviews with former associates indicate his continuing interest in increasing visual acuity. *Alternate explanation.* There is some indication that he was also interested in paranormal phenomena such as clairvoyance or prevision, and it is possible, though at present deemed unlikely, that his use of the term refers to 'looking ahead' in time."

And so on, and on.

Knefhausen gazed at the litter of papers lovingly and hopelessly, and passed his hand over his forehead. The kids! They were so marvelous . . . but so unruly . . . and so hard to understand. How unruly of them to have concealed their true accomplishments. The secret of hydrogen fusion! That alone would justify, more than justify, the entire project. But where was it? Locked in that number-jumber gibberish. Knefhausen was not without appreciation of the elegance of the method. He, too, was capable of taking seriously a device of such luminous simplicity. Once the number

was written out you had only to start by dividing it by two as many times as possible, and the number of times would give you the first letter. Then divide by the next prime, three, and that number of times would give you the second letter. But the practical difficulties! You could not get even the first letter until you had the whole number, and IBM had refused even to bid on constructing a bank of computers to write that number out unless the development time was stretched to twenty-five years. *Twenty-five years.* And meanwhile in that number was hidden probably the secret of hydrogen fusion, possibly many greater secrets, most certainly the key to Knefhausen's own well-being over the next few weeks. . . .

His phone rang.

He grabbed it and shouted into it at once: "Yes, Mr. President!"

He had been too quick. It was only his secretary. Her voice was shaking but determined.

"It's not the President, Dr. Knefhausen, but Senator Copley is on the wire and he says it is urgent. He says—"

"No!" shouted Knefhausen and banged down the phone. He regretted it even as he was doing it. Copley was very high, chairman of the Armed Forces Committee; he was not a man Knefhausen wished to have as an enemy, and he had been very careful to make him a friend over years of patient fence-building. But he could not speak to him, or to anyone, while the President was not answering his calls. Copley's rank was high, but he was not in the direct hierarchical line over Knefhausen. When the top of that line refused to talk to him Knefhausen was cut off from the world.

He attempted to calm himself by examining the situation objectively. The pressures on the President just now: they were enormous. There was the continu-

ing trouble in the cities, all the cities. There were the political conventions coming up. There was the need to get elected for a third term, and the need to get the law amended to make that possible. And yes, Knefhausen admitted to himself, the worst pressure of all was the rumors that were floating around about the *Constitution*. He had warned the President. It was unfortunate the President had not listened. He had said that a secret known to two people is compromised and a secret known to more than two is no secret. But the President had insisted on the disclosure to that ever-widening circle of high officials—sworn, of course, to secrecy, but what good was that? In spite of everything, there had been leaks. Fewer than one might have feared. More than one could stand.

He touched the reports from *Constitution* caressingly. Those beautiful kids, they could still make everything right, so wonderful. . . .

Because it was he who had made them wonderful, he confessed to himself. He had invented the idea. He had selected them. He had done things which he did not quite even yet reconcile himself to, to make sure that it was they and not some others who were on the crew. He had, above all, made doubly sure by insuring their loyalty in every way possible. Training. Discipline. Ties of affection and friendship. More reliable ties: loading their food supplies, their entertainment tapes, their programmed activities with every sort of advertising inducement, M/R compulsion, psychological reinforcement he could invent or find, so that whatever else they did they did not fail to report faithfully back to Earth. Whatever else happened, there was that. The data might be hard to entangle, but would be there. They could not help themselves; his commandments were stronger than God's; like Martin Luther they must say *Ich kann nicht anders*, and come Pope or Inquisi-

tion they must stand by it. They would learn, and tell what they learned, and thus the investment would be repaid. . . .

The telephone!

He was talking before he had it even to his mouth. "Yes, yes! This is Dr. Knefhausen, yes!" he gabbled. Surely it must be the President now—

It was not.

"Knefhausen!" shouted the man on the other end. "Now, listen, I'll tell you what I told that bitch pig girl of yours, if I don't talk to you on the phone *right now* I'll have Fourth Armored in there to arrest you and bring you to me in twenty minutes. So listen!"

Knefhausen recognized both voice and style. He drew a deep breath and forced himself to be calm. "Very well, Senator Copley," he said, "what is it?"

"The game is blown, boy! That's what it is. That boy of yours in Huntsville, what's his name, the photo technician—"

"*Hauptmann?*"

"That's him! Would you like to know where he is, you dumb Kraut bastard?"

"Why, I suppose . . . I should think in Huntsville—"

"Wrong, boy! Your Kraut bastard friend claimed he didn't feel good and took some accrued sick time. Intelligence kept an eye on him up to a point, didn't stop him, wanted to see what he'd do. Well, they saw. They saw him leaving Orly Airport an hour ago in an Aeroflot plane. Put your brain to work on that one, Knefhausen! He's defected. Now start figuring out what you're going to do about it, and it better be good!"

Knefhausen said something, he did not know what, and hung up the phone, he did not remember when. He stared glassily into space for a time.

Then he flicked the switch for his secretary and said, not listening to her stammering apologies, "That long-

distance call that came from Hauptmann before, Mrs. Ambrose. You didn't say where it was from."

"It was an overseas call, Dr. Knefhausen. From Paris. You didn't give me a chance to—"

"Yes, yes. I understand. Thank you. Never mind." He hung up and sat back. He felt almost relieved. If Hauptmann had gone to Russia it could only be to tell them that the picture was faked, and not only was there no planet for the astronauts to land on but it was not a mistake, even, actually a total fraud. So now it was all out of his hands. History would judge him now. The die was cast. The Rubicon was crossed.

So many literary allusions, he thought deprecatingly. Actually it was not the judgment of history that was immediately important but the judgment of certain real people now alive and likely to respond badly. And they would judge him not so much by what might be or what should have been, as by what was. He shivered in the cold of that judgment, and reached for the telephone to try once more to call the President. But he was quite sure the President would not answer, then or ever again.

CONSTITUTION FIVE

Old reliable P.O.'d Shef here. Look, we got your message. I don't want to discuss it. You've got a nerve. You're in a bad mood, aren't you? If you can't say anything nice, don't say anything at all. We do the best we can, and that's not bad, and if we don't do exactly what you want us to maybe it's because we know quite a lot more than you did when you fired us off at that blob of moonshine you call Alpha-Aleph. Well, thanks a lot for nothing.

On the other hand, thanks a little for what you did do, which at least worked out to get us where we are, and I don't mean spatially. So I'm not going to yell at

you. I just don't want to talk to you at all. I'll let the others talk for themselves.

Dot Letski speaking. This is important. Pass it on. I have three things to tell you that I do not want you to forget. *One: Most problems have grammatical solutions.* The problem of transporting people from Earth to another planet does not get solved by putting pieces of steel together one at a time at random, and happening to find out you've built the *Constitution* by accident. It gets solved by constructing a model—=equation (=grammar)—which describes the necessary circumstances under which the transportation occurs. Once you have the grammatical model, you just put the metal around it and it goes like gangbusters.

When you have understood this you will be ready for: *Two: There is no such thing as causality.* What a waste of time it has been, trying to assign "causes" to "events"! You say things like, "Striking a match causes it to burn." True statement? No, false statement. You find yourself in a whole waffle about whether the "act" of "striking" is "necessary" and/or "sufficient" and you get lost in words. Pragmatically useful grammars are without tenses. In a decent grammar—which this English-language one, of course, is not, but I'll do the best I can—you can make a statement like "There exists a conjunction of forms of matter—specified—which combine with the release of energy at a certain temperature—which may be the temperature associated with heat of friction." Where's the causality? "Cause" and "effect" are in the same timeless statement. So, *Three: There are no such things as empirical laws.* Ski came to understand that he was able to contain the plasma in our jet indefinitely, not by pushing particles around in brute-force magnetic squeezes, but by encouraging them to want to stay together. There are other ways of saying what he does—="creates an envi-

ronment in which centripetal exceed centrifugal forces" —but the way I said it is better because it tells something about your characters. Bullies, all of you. Why can't you be nice to things if you want them to be nice to you? Be sure to pass this on to T'in Fa at Tientsin, Professor Morris at All Soul's and whoever holds the Carnap chair at UCLA.

Flo's turn. My mother would have loved my garden. I have drumsticks and daffodils growing side by side in the sludgy sand. They do so please us, and we them! I will probably transmit a full horticultural handbook at a future date, but meanwhile it is shameful to eat a radish. Carrots, on the other hand, enjoy it.

A statement of William Becklund, deceased. I emerged into the world, learned, grew, ate, worked, moved and died. Alternatively, I emerged from the hydrogen flare, shrank, disgorged and reentered the womb one misses so. You may approach it from either end, it makes no difference at all which way you look at it.

Observational datum, Letski. At time *t*, a Dirac number incommensurable with GMT, the following phenomenon is observed:

The radio source Centaurus A is identified as a positionally stable single collective object rather than two intersecting gas clouds and is observed to contract radially toward a center. Analysis and observation reveal it to be a Black Hole of which the fine detail is not detectable as yet. One infers all galaxies develop such central vortices, with implications of interest to astronomers and eschatologists. I, Seymour Letski, propose to take a closer look but the others prefer to

continue programmed flight first. Harvard-Smithsonian notification service, please copy.

"Starbow," a preliminary study for a rendering into English of a poem by James Barstow:

Gaggle of goslings but pick of our race
We waddle through relativistic space.
Dilated, discounted, despondent we scan:
But vacant the Sign of the Horse and the Man.
Vacant the Sign of the Man and the Horse,
And now we conjecture the goal of our course.
Tricked, trapped and cozened, we ruefully run
After the child of the bachelor sun.
The trick is revealed and the trap is confessed
And we are the butts of the dim-witted jest.
O Gander who made us, O Goose who laid us,
How lewdly and twistedly you betrayed us!
We owe you a debt. We won't forget.
With fortune and firmness we'll pay you yet.
Give us some luck and we'll timely send
Your pot of gold from the starbow's end.

Ann Becklund:

I think it was Stanley Weinbaum who said that from three facts a truly superior mind should be able to deduce the whole universe. (Ski thinks it is possible with a finite number, but considerably larger than that). We are so very far from being truly superior minds by those standards, or even by our own. Yet we have a much larger number of facts to work with than three, or even three thousand, and so we have deduced a good deal.

This is not as valuable to you as you might have hoped, dear old bastardly Kneffie and all you bastardly others, because one of the things that we have deduced is that we can't tell you everything, because you

wouldn't understand. We could help you along, some of you, if you were here, and in time you would be able to do what we do easily enough, but not by remote control.

But all is not lost, folks! Cheer up! You don't deduce like we deduce, but on the other hand you have so very much more to work from. Try. Get smart. You can do it if you want to. Set your person at rest, compose your mind before you speak, make your relations firm before you ask for something. Try not to be loathsome about it. Don't be like the fellow in the Changes. "He brings increase to no one. Indeed, someone even strikes him."

We've all grown our toes back now, even Will, although it was particularly difficult for him since he had been killed, and we've inscribed the bones and used them with very good effect in generating the hexagrams. I hope you see the point of what we did. We could have gone on with tossing coins or throwing the yarrow stalks, or at least the closest Flo could breed to yarrow stalks. We didn't want to do that because it's not the optimum way.

The person who doesn't keep his heart constantly steady might say, "Well, what's the difference?" That's a poor sort of question to ask. It implies a deterministic answer. A better question is, "Does it make a difference?", and the answer to that is, "Yes, probably, because in order to do something right you must do it right." That is the law of identity, in any language.

Another question you might ask is, "Well, what source of knowledge are you actually tapping when you consult the hexagrams?" That's a better kind of question in that it doesn't *force* a wrong answer, but the answer is, again, indeterminate. You might view the *I Ching* as a sort of Rorschach bundle of squiggles that has no innate meaning but is useful because your

own mind interprets it and puts sense into it. Feel free! You might think of it as a sort of memory bank of encoded lore. Why not? You might skip it entirely and come to knowledge in some other tao, any tao you like. ("The superior man understands the transitory in the light of the eternity of the end.") That's fine, too!

But whatever way you do it, you should *do* it that way. We needed inscribed bones to generate hexagrams, because that was the right way, and so it was no particular sacrifice to lop off a toe each for the purpose. It's working out nicely, except for one thing. The big hangup now is that the translations are so degraded, Chinese to German, German to English and error seeping in at every step, but we're working on that now.

Perhaps I will tell you more at another time. Not now. Not very soon. Eve will tell you about that.

Eve Barstow, the Dummy, comes last and, I'm afraid, least.

When I was a little girl I used to play chess, badly, with very good players, and that's the story of my life. I'm a chronic overachiever. I can't stand people who aren't smarter and better than I am, but the result is that I'm the runt of the litter every time. They are all very nice to me here, even Jim, but they know what the score is and so do I.

So I keep busy and applaud what I can't do. It isn't a bad life. I have everything I need, except pride.

Let me tell you what a typical day is like here between Sol and Centaurus. We wake up—if we have been sleeping, which some of us still do—and eat—if we are still eating, as all but Ski and, of course, Will Becklund do. The food is delicious and Florence has induced it to grow cooked and seasoned where that is desirable, so it's no trouble to go over and pick yourself

a nice poached egg or a clutch of French fries. (I really prefer brioche in the mornings, but for sentimental reasons she can't manage it.) Sometimes we ball a little or sing old campfire songs. Ski comes down for that, but not for long, and then he goes back to looking at the universe. The starbow is magnificent and appalling. It is now a band about 40° across, completely surrounding us with colored light. One can always look in the other frequencies and see ghost stars before us and behind us, but in the birthright bands the view to the front and rear is now dead black and the only light is that beautiful banded ring of powdery stars.

Sometimes we write plays or have a little music. Shef had deduced four lost Bach piano concerti, very reminiscent of Corelli and Vivaldi, with everything going at once in the tuttis, and we've all adapted them for performance. I did mine on the moog, but Ann and Shef synthesized whole orchestras. Shef's particularly cute. You can tell that the flautist has early emphysema and two people in the violin section have been drinking, and he's got Toscanini conducting like a *risorgimento* metronome. Flo's oldest daughter made up words and now she sings a sort of nursery rhyme adaptation of some Buxtehude chorales; oh, I didn't tell you about the kids. We have eleven of them now. Ann, Dot and I have one apiece, and Florence has eight. (But they're going to let me have quadruplets next week.) They let me take care of them pretty much for the first few weeks, while they're little, and they're *so* darling.

So mostly I spend my time taking care of the kids and working out tensor equations that Ski kindly gives me to do for him, and, I must confess it, feeling a little lonely. I *would* like to watch a TV quiz show over a cup of coffee with a friend! They let me do over the interior of our mobile home now and then. The other

day I redid it in Pittsburgh suburban as a joke. Would you believe French windows in interstellar space? We never open them, of course, but they look real pretty with the chintz curtains and lace tiebacks. And we've added several new rooms for the children and their pets. (Flo grew them the cutest little bunnies in the hydroponics plot).

Well, I've enjoyed this chance to gossip, so will sign off now. There is one thing I have to mention. The others have decided we don't want to get any more messages from you. They don't like the way you try to work on our subconsciouses and all—not that you succeed, of course, but you can see that it's still a little annoying—and so in future the dial will be set at six-six-oh, all right, but the switch will be in the "off" position. It wasn't my idea, but I was glad to go along. I *would* like some slightly less demanding company from time to time, although not, of course, yours.

WASHINGTON FIVE

Once upon a time the building that was now known as DoD Temp Restraining Quarters 7—you might as well call it with the right word, "jail," Knefhausen thought—had been a luxury hotel in the Hilton chain. The maximum security cells were in the underground levels, in what had been meeting rooms. There were no doors or windows to the outside. If you did get out of your own cell you had a flight of stairs to get up before you were at ground level, and then the guards to break through to get to the open. And then, even if there happened not to be an active siege going on at the moment, you took your chances with the roaming addicts and activists outside.

Knefhausen did not concern himself with these matters. He did not think of escape, or at least didn't after the first few panicky moments, when he realized he

was under arrest. He stopped demanding to see the President after the first few days. There was no point in appealing to the White House for help when it was the White House that had put him here. He was still sure that if only he could talk to the President privately for a few moments he could clear everything up. But as a realist he had faced the fact that the President would never talk to him privately again.

So he counted his blessings.

First, it was comfortable here. The bed was good, the rooms were warm. The food still came from the banquet kitchens of the hotel, and it was remarkably good for jailhouse fare.

Second, the kids were still in space and still doing some things, great things, even if they did not report what. His vindication was still a prospect.

Third, the jailers let him have newspapers and writing materials, although they would not bring him his books, or give him a television set.

He missed the books, but nothing else. He didn't need TV to tell him what was going on outside. He didn't even need the newspapers, ragged, thin and censored as they were. He could hear for himself. Every day there was the rattle of small-arms fire, mostly far-off and sporadic, but once or twice sustained and heavy and almost overhead, Brownings against AK-47s, it sounded like, and now and then the slap and smash of grenade launchers. Sometimes he heard sirens hooting through the streets, punctuated by clanging bells, and wondered that there was still a civilian fire department left to bother. (Or was it still civilian?) Sometimes he heard the grinding of heavy motors that had to be tanks. The newspapers did little to fill in the details, but Knefhausen was good at reading between the lines. The Administration was holed up somewhere—Key Biscayne, or Camp David, or Southern California, no

one was saying where. The cities were all in red revolt. *Herr Omnes* had taken over.

For these disasters Knefhausen felt unjustly blamed. He composed endless letters to the President, pointing out that the serious troubles of the Administration had nothing to do with Alpha-Aleph: the cities had been in revolt for most of a generation, the dollar had become a laughingstock since the Indochinese wars. Some he destroyed, some he could get no one to take from him, a few he managed to dispatch—and got no answers.

Once or twice a week a man from the Justice Department came to ask him the same thousand pointless questions once again. They were trying to build up a dossier to prove it was all his fault, Knefhausen suspected. Well, let them. He would defend himself when the time came. Or history would defend him. The record was clear. With respect to moral issues, perhaps, not so clear, he conceded. No matter. One could not speak of moral questions in an area so vital to the search for knowledge as this. The dispatches from the *Constitution* had already produced so much—although, admittedly, some of the most significant parts were hard to understand. The Gödel message had not been unscrambled, and the hints of its contents remained only hints.

Sometimes he dozed and dreamed of projecting himself to the *Constitution*. It had been a year since the last message. He tried to imagine what they had been doing. They would be well past the midpoint now, decelerating. The starbow would be broadening and diffusing every day. The circles of blackness before and behind them would be shrinking. Soon they would see Alpha Centauri as no man had ever seen it. To be sure, they would then see that there was no planet called Aleph circling the primary, but they had guessed that somehow long since. Brave, wonderful kids! Even

so they had gone on. This foolishness with drugs and sex, what of it? One opposed such goings-on in the common run of humanity, but it had always been so that those who excelled and stood out from the herd could make their own rules. As a child he had learned that the plump, proud air leader sniffed cocaine, that the great warriors took their sexual pleasure sometimes with each other. An intelligent man did not concern himself with such questions, which was one more indication that the man from the Justice Department, with his constant hinting and prying into Knefhausen's own background, was not really very intelligent.

The good thing about the man from the Justice Department was that one could sometimes deduce things from his questions, and rarely, oh, very rarely, he would sometimes answer a question himself. "Has there been a message from the *Constitution?*" "No, of course not, Dr. Knefhausen. Now, tell me again, who suggested this fraudulent scheme to you in the first place?"

Those were the highlights of his days, but mostly the days just passed unmarked.

He did not even scratch them off on the wall of his cell, like the prisoner in the Chateau d'If. It would have been a pity to mar the hardwood paneling. Also he had other clocks and calendars. There was the ticking of the arriving meals, the turning of the seasons as the man from the Justice Department paid his visits. Each of these was like a holiday—a holy day, not joyous but solemn. First there would be a visit from the captain of the guards with two armed soldiers standing in the door. They would search his person and his cell on the chance that he had been able to smuggle in a . . . a what? A nuclear bomb, maybe. Or a pound of pepper to throw in the Justice man's eyes. They would find nothing, because there was nothing to find. And then they would go away and for a long time there would

be nothing. Not even a meal, even if a meal time happened to be due. Nothing at all, until an hour or three hours later the Justice man would come in with his own guard at the door, equally vigilant inside and out, and his engineer manning the tape recorders, and his questions.

And then there was the day when the man from the Justice Department came and he was not alone. With him was the President's secretary, Murray Amos.

How treacherous is the human heart! When it has given up hope how little it takes to make it hope again!

"Murray!" cried Knefhausen, almost weeping, "it's so good to see you again! The President, is he well? What can I do for you? Have there been developments?"

Murray Amos paused in the doorway. He looked at Dieter von Knefhausen and said bitterly, "Oh, yes, there have been developments. Plenty of them. The Fourth Armored has just changed sides, so we are evacuating Washington. And the President wants you out of here at once."

"No, no! I mean . . . oh, yes, it is good that the President is concerned about my welfare, although it is bad about the Fourth Armored. But what I mean, Murray, is this: has there been a message from the *Constitution*?"

Amos and the Justice Department man looked at each other. "Tell me, Dr. Knefhausen," said Amos silkily, "how did you manage to find that out?"

"Find it out? How could I find it out? No, I only asked because I hoped. There has been a message, yes? In spite of what they said? They have spoken again?"

"As a matter of fact, there has been," said Amos thoughtfully. The Justice Department man whispered piercingly in his ear, but Amos shook his head. "Don't worry, we'll be coming in a second. The convoy won't

go without us. Yes, Knefhausen, the message came through to Goldstone two hours ago. They have it at the decoding room now."

"Good, very good!" cried Knefhausen. "You will see, they will justify all. But what do they say? Have you good scientific men to interpret it? Can you understand the contents?"

"Not exactly," said Amos, "because there's one little problem the code room hadn't expected and wasn't prepared for. The message wasn't coded. It came in clear, but the language was Chinese."

CONSTITUTION SIX

Ref.: CONSIX T51/11055/*7

CLASSIFIED MOST SECRET

Subject: Transmission from U.S. Starship *Constitution.*

The following message was received and processed by the decrypt section according to standing directives. Because of its special nature, an investigation was carried out to determine its provenance. Radio-direction data received from Farside Base indicate its origin along a line of sight consistent with the present predicted location of the *Constitution.* Strength of signal was high but within appropriate limits, and degradation of frequency separation was consistent with relativistic shifts and scattering due to impact with particle and gas clouds.

Although available data do not prove beyond doubt that this transmission originated with the starship, no contraindications were found.

On examination, the text proved to be a phonetic transcription of what appears to be a dialect of Middle Kingdom Mandarin. Only a partial translation has been completed. (See note appended to text.) The translation presented unusual difficulties for two reasons: one, the difficulty of finding a translator of sufficient skill

who could be granted appropriate security status; two, because—conjecturally—the language used may not correspond exactly to any dialect but may be an artifact of the *Constitution's* personnel. (See PARA EIGHT.)

This text is PROVISIONAL AND NOT AUTHENTICATED and is furnished only as a first attempt to translate the contents of the message into English. Efforts are being continued to translate the full message, and to produce a less corrupt text for the section herewith. Later versions and emendations will be forwarded when available.

TEXT FOLLOWS:

PARA ONE. The one who speak for all—*Lt-Col Sheffield H Jackman*—rests. With righteous action comes surcease from care. I—*identity not certain, but probably Mrs. Annette Marin Becklund, less probably one of the other three female personnel aboard, or one of their descendants*—come in his place, moved by charity and love.

PARA TWO. It is not enough to study or to do deeds which make the people frown and bow their heads. It is not enough to comprehend the nature of the sky or the sea. Only through the understanding of all can one approach wisdom, and only through wisdom can one act rightly.

PARA THREE. These are the precepts as it is given us to see them:

PARA FOUR. The one who imposes his will by force lacks justice. Let him be thrust from a cliff.

PARA FIVE. The one who causes another to lust for a trifle of carved wood or a sweetmeat lacks courtesy. Let him be restrained from the carrying out of wrong practices.

PARA SIX. The one who ties a knot and says, "I do not care who must untie it," lacks foresight. Let him wash the ulcers of the poor and carry nightsoil

for all until he learns to see the day to come as brother to the day that is.

PARA SEVEN. We who are in this here should not impose our wills on you who are in that here by force. Understanding comes late. We regret the incident of next week, for it was done in haste and in error. The one who speaks for all acted without thinking. We who are in this here were sorry for it afterward.

PARA EIGHT. You may wonder—*literally: ask thoughtless questions of the hexagrams*—why we are communicating in this language. The reason is in part recreational, in part heuristic—*literally: because on the staff hand one becomes able to strike a blow more ably when blows are struck repeatedly*—but the nature of the process is such that you must go through it before you can be told what it is. Our steps have trodden this path. In order to reconstruct the Chines of the *I Ching* it was first necessary to reconstruct the German of the translation from which the English was made. Error lurks at every turn. [*Literally: false apparitions shout at one each time the path winds.*] Many flaws mark our carving. Observe it in silence for hours and days until the flaws become part of the work.

PARA NINE. It is said that you have eight days before the heavier particles arrive. The dead and broken will be few. It will be better if all airborne nuclear reactors are grounded until the incident is over.

PARA TEN. When you have completed rebuilding send us a message, directed to the planet Alpha-Aleph. Our home should be prepared by then. We will send a ferry to help colonists across the stream when we are ready:

The above text comprises the first 852 groups of the transmission. The remainder of the text, comprising approximately 7,500 groups, has not been satisfactorily translated. In the opinion of a consultant from the Oriental Languages Department at Johns Hopkins it may be a poem.

/s/Durward S. RICHTER

Durward S. RICHTER
Major General, USMC
Chief Cryptographer
Commanding

Distribution: X X X
BY HAND ONLY

WASHINGTON SIX

The President of the United States—Washington—opened the storm window of his study and leaned out to yell at his Chief Science Adviser. "Harry, get the lead out! We're waiting for you!"

Harry looked up and waved, then continued doggedly plowing through the dripping jungle that was the North Lawn. Between the overgrown weeds and the rain and the mud it was slow going, but the President had little sympathy. He slammed down the window and said, "That man, he just goes out of his way to aggravate me. How long am I supposed to wait for him so I can decide if we have to move the capital or not?"

The Vice President looked up from her knitting. "Jimbo, honey, why do you fuss yourself like that? Why don't we just move and get it over with?"

"Well, it looks so lousy." He threw himself into a chair despondently. "I was really looking forward to the Tenth Anniversary parade," he complained. "Ten

years, that's really worth bragging about! I don't want to hold it out in the sticks, I want it right down Constitution Avenue, just like the old days, with the people cheering and the reporters and the cameras all over and everything. Then let that son of a bitch in Omaha say I'm not the real President."

His wife said placidly, "Don't fuss yourself about him, honey. You know what I've been thinking, though? The parade might look a little skimpy on Constitution Avenue anyway. It would be real nice on a kind of littler street."

"Oh, what do you know? Anyway, where would we go? If Washington's under water, what makes you think Bethesda would be any better?"

His Secretary of State put down his solitaire cards and looked interested. "Doesn't have to be Bethesda," he said. "I got some real nice land up near Dulles we could use. It's high there."

"Why, sure. Lots of nice land over to Virginia," the Vice President confirmed. "Remember when we went out on that picnic after your Second Inaugural? That was at Fairfax Station. There were hills all around. Just beautiful."

The President slammed his fist on the coffee table and yelled, "I'm not the President of Fairfax Station, I'm the President of the U.S. of A! What's the capital of the U.S. of A.? Washington! My God, don't you see how those jokers in Houston and Omaha and Salt Lake and all would laugh if they heard I had to move out of my own capital?"

He broke off, because his Chief Science Adviser was coming in the door, shaking himself, dripping mud as he got out of his oilskin slicker. "Well?" demanded the President. "What did they say?"

Harry sat down. "It's terrible out there. Anybody got a dry cigarette?"

The President threw him a pack. Harry dried his fingers on his shirt front before he drew one out. "Well," he said, "I went to every boat captain I could find. They all said the same. Ships they talked to, places they'd been. All the same. Tides rising all up and down the coast."

He looked around for a match. The President's wife handed him a gold cigarette lighter with the Great Seal of the United States on it, which, after some effort, he managed to ignite. "It don't look good, Jimmy. Right now it's low tide and that's all right, but it's coming in. And tomorrow it'll come in a little higher. And there will be storms—not just rain like this. I mean, you got to figure on a tropical depression coming up from the Bahamas now and then."

"We're not in the tropics," said the Secretary of State suspiciously.

"It doesn't mean that," said the Science Adviser, who had once given the weather reports over the local ABC television station, when there was such a thing as a television network. "It means storms. Hurricanes. But they're not the worst things, it's the tide. If the ice is melting, then they're going to keep getting higher regardless."

The President drummed his fingers on the coffee table. Suddenly he shouted, "I don't *want* to move my capital!"

No one answered. His temper outbursts were famous. The Vice President became absorbed in her knitting, the Secretary of State picked up his cards and began to shuffle, the Science Adviser picked up his slicker and carefully hung it on the back of a door.

The President said, "You got to figure it this way. If we move out, then all those local yokels that claim to be the President of the United States are going to be just that much better off, and the eventual reunification

of our country is going to be just that much more delayed." He moved his lips for a moment, then burst out, "I don't ask anything for myself! I never have. I only want to play the part I have to play in what's good for all of us, and that means keeping up my position as the *real* President, according to the U.S. of A. Constitution as amended. And that means I got to stay right here in the real White House, no matter what."

His wife said hesitantly, "Honey, how about this? The other President had like a summer White House—Camp David and like that. Nobody fussed about it. Why couldn't you do the same as they did? There's the nicest old farmhouse out near Fairfax Station that we could fix up to be real pretty."

The President looked at her with surprise. "Now, that's good thinking," he declared. "Only we can't move permanently, and we have to keep this place garrisoned so nobody else will take it away from us, and we have to come back here once in a while. How about that, Harry?"

His Science Adviser said thoughtfully, "We could rent some boats, I guess. Depends. I don't know how high the water might get."

"No 'guess'! No 'depends'! That's a national priority. We have to do it that way to keep that bastard in Omaha paying attention to the real President."

"Well, Jimbo, honey," said the Vice President after a moment, emboldened by his recent praise, "you have to admit they don't pay a lot of attention to us right now. When was the last time they paid their taxes?"

The President looked at her foxily over his glasses. "Talking about that," he said, "I might have a little surprise for them anyway. What you might call a secret weapon."

"I hope it does better than we did in the last war,"

said his wife, "because if you remember, when we started to put down the uprising in Frederick, Maryland, we got the pee kicked out of us."

The President stood up, indicating the Cabinet meeting was over.

"Never mind," he said sunnily. "You go on out again, Harry, and see if you can find any good maps in the Library of Congress where they got the fires put out. Find us a nice high place within, um, twenty miles if you can. Then we'll get the Army to condemn us a Summer White House like Mae says, and maybe I can sleep in a bed that isn't moldy for a change."

His wife looked worried, "What are you going to do, Jim?"

He chuckled. "I'm going to check out my secret weapon."

He shooed them out of his study and, when they were gone, went to the kitchen and got himself a bottle of Fresca from the six-pack in the open refrigerator. It was warm, of course. The Marine guard company was still trying to get the gas generator back in operation, but they were having little success. The President didn't mind. They were his personal Praetorians and, if they lacked a little as appliance repairmen, they had proved their worth when the chips were down. The President was always aware that during the Troubles he had been no more than any other Congressman—appointed to fill a vacancy, at that—and his rapid rise to Speaker of the House and Heir Apparent, finally to the Presidency itself, was due not only to his political skills and knowhow but also to the fact that he was the only remotely legitimate heir to the presidency who also happened to have a brother-in-law commanding the Marine garrison in Washington.

The President was, in fact, quite satisfied with the way the world was going. If he envied presidents of

the past—missiles, fleets of nuclear bombers, billions of dollars to play with—he certainly saw nothing, when he looked at the world around him, to compare with his own stature in the real world he lived in.

He finished the soda, opened his study door a crack and peered out. No one was nearby. He slipped out and down the back stairs. In what had once been the public parts of the White House you could see the extent of the damage more clearly. After the riots and the trashings and the burnings and the coups, the will to repair and fix up had gradually dwindled away. The President didn't mind. He didn't even notice the charred walls and the fallen plaster. He was listening to the sound of a distant gasoline pump chugging away, and smiling to himself as he approached the underground level where his secret weapon was locked up.

The secret weapon, whose name was Dieter von Knefhausen, was trying to complete the total defense of every act of his life that he called his memoirs.

He was less satisfied with the world than the President. He could have wished for many changes. Better health, for one thing; he was well aware that his essential hypertension, his bronchitis and his gout were fighting the last stages of a total war to see which would have the honor of destroying their mutual battleground, which was himself. He did not much mind his lack of freedom, but he did mind the senseless destruction of so many of his papers.

The original typescript of his autobiography was long lost, but he had wheedled the President—the pretender, that is, who called himself the President—into sending someone to find what could be found of them. A few tattered and incomplete carbon copies had turned up. He had restored some of the gaps as best his memory and available data permitted, telling again the story of how

he had planned Project Alpha-Aleph and meticulously itemizing the details of how he had lied, forged and falsified to bring it about.

He was as honest as he could be. He spared himself nothing. He admitted his complicity in the "accidental" death of Ann Barstow's first husband in a car smash, thus leaving her free to marry the man he had chosen to go with the crew to Alpha Centauri. He had confessed he had known the secret would not last out the duration of the trip, thus betraying the trust of the President who made it possible. He put it all in, all he could remember, and boasted of his success.

For it was clear to him that his success was already proved. What could be surer evidence of it than what had happened ten years ago? The "incident of next week" was as dramatic and complete as anyone could wish. If its details were still indecipherable, largely because of the demolition of the existing technology structure it had brought about, its main features were obvious. The shower of heavy particles—baryon? perhaps even quarks?—had drenched the Earth. The source had been traced to a point in the heavens identical with that plotted for the *Constitution.*

Also there were the messages received; taken together, there was no doubt that the astronauts had developed knowledge so far in advance of anything on Earth that, from two light-years out, they could impose their will on the human race. They had done it. In one downpour of particles, the entire military-industrial complex of the planet was put out of action.

How? How? Ah, thought Knefhausen, with envy and pride, that was the question. One could not know. All that was known was that every nuclear device—bomb, power plant, hospital radiation source or stockpile—had simultaneously soaked up the stream of particles and at that moment ceased to exist as a source of nuclear

energy. It was not rapid and catastrophic, like a bomb. It was slow and long-lasting. The uranium and the plutonium simply melted, in the long, continuous reaction that was still bubbling away in the seething lava lakes where the silo had stood and the nuclear power plants had generated electricity. Little radiation was released, but a good deal of heat.

Knefhausen had long since stopped regretting what could not be helped, but wistfully he still wished he had the opportunity to measure the total heat flux properly. Not less than 10^{16} watt-years, he was sure, just to judge by the effects on the Earth's atmosphere, the storms, the gradual raising of temperature all over, above all by the rumors about the upward trend of sea level that bespoke the melting of the polar ice caps. There was no longer even a good weather net, but the fragmentary information he was able to piece together suggested a world increase of four, maybe as many as six or seven degrees Celsius already, and the reactions still seething away in Czechoslovakia, the Congo, Colorado and a hundred lesser infernos.

Rumors about the sea level?

Not rumors, no, he corrected himself, lifting his head and staring at the snake of hard rubber hose that began under the duckboards at the far end of the room and ended outside the barred window, where the gasoline pump did its best to keep the water level inside his cell below the boards. Judging by the inflow, the grounds of the White House must be nearly awash.

The door opened. The President of the United States (Washington) walked in, patting the shoulder of the thin, scared, hungry-looking kid who was guarding the door.

"How's it going, Knefhausen?" the President began sunnily. "You ready to listen to a little reason yet?"

"I'll do whatever you say, Mr. President, but as I have

told you there are certain limits. Also I am not a young man, and my health—"

"Screw your health and your limits," shouted the President. "Don't start up with me, Knefhausen!"

"I am sorry, Mr. President," whispered Knefhausen.

"Don't be sorry! I judge by results. You know what it takes to keep that pump going just so you won't drown? Gas is rationed, Knefhausen! Takes a high national priority to get it! I don't know how long I'll be able to justify this continuous drain on our resources if you don't cooperate."

Sadly, but stubbornly, Knefhausen said: "As far as I am able, Mr. President, I cooperate."

"Yeah. Sure." But the President was in an unusually good mood today, Knefhausen observed, with the prisoner's paranoid attention to detail, and in a moment he said: "Listen, let's not get uptight about this. I'm making you an offer. Say the word and I'll fire that dumb son of a bitch Harry Stokes and make you my Chief Science Adviser. How would that be? Right up at the top again. An apartment of your own. Electric lights! Servants—you can pick 'em out yourself, and there's some nice-looking little girls in the pool. The best food you ever dreamed of. A chance to perform a real service for the U. S. of A., helping to reunify this great country to become once again the great power it should and must be!"

"Mr. President," Knefhausen said, "naturally, I wish to help in any way I can, but we have been over all this before. I'll do anything you like, but I don't know how to make the bombs work again. You saw what happened, Mr. President. They're gone."

"I didn't say bombs, did I? Look, Kneffie, I'm a reasonable man. How about this: you promise to use your best scientific efforts *in any way you can.* You say you can't make bombs; all right. But there will be other things."

"What other things, Mr. President?"

"Don't push me, Knefhausen. Anything at all. Anything where you can perform a service for your country. You give me that promise and you're out of here today. Or would you rather I just turned off the pump?"

Knefhausen shook his head, not in negation but in despair. "You do not know what you are asking. What can a scientist do for you today? Ten years ago, yes—even five years ago. We could have worked something out maybe, I could have done something. But now the preconditions do not exist. When all the nuclear plants went out—when the factories that depended on them ran out of power—when the fertilizer plants couldn't fix nitrogen and the insecticide plants couldn't deliver—when the people began to die of hunger and the pestilences started—"

"I know all that, Knefhausen. Yes, or no?"

The scientist hesitated, looking thoughtfully at his adversary. A gleam of the old shrewdness appeared in his eyes.

"Mr. President," he said slowly. "You know something. Something has happened."

"Right," crowed the President. "You're smart. Now tell me, what is it I know?"

Knefhausen shook his head. After seven decades of vigorous life, and another decade of slowly dying, it was hard to hope again. This terrible little man, this upstart, this lump—he was not without a certain animal cunning, and he seemed very sure. "Please, Mr. President. Tell me."

The President put a finger to his lips, and then an ear to the door. When he was convinced no one could be listening, he came closer to Knefhausen and said softly:

"You know that I have trade representatives all over, Knefhausen. Some in Houston, some in Salt Lake, some even in Montreal. They are not always there just for

trade. Sometimes they find things out, and tell me. Would you like to know what my man in Anaheim has just told me?'

Knefhausen did not answer, but his watery old eyes were imploring.

"A message," whispered the President.

"From the *Constitution*?" cried Knefhausen. "But, no, it is not possible! Farside is gone, Goldstone is destroyed, the orbiting satellites are running down—"

"It wasn't a radio message," said the Preident. "It came from Mount Palomar. Not the big telescope, because that got ripped off, too, but what they call a Schmidt. Whatever that is. It still works. And they still have some old fogies who look through it now and then, for old times' sake. And they got a message, in laser light. Plain Morse code. From what they said was Alpha Centauri. From your little friends, Knefhausen."

He took a piece of paper from his pocket and held it up.

Knefhausen was racked by a fit of coughing, but he managed to croak: "Give it to me!"

The President held it away. "A deal, Knefhausen?"

"Yes, yes! Anything you say, but give me the message!"

"Why, certainly," smiled the President, and passed over the much-creased sheet of paper. It said:

PLEASE BE ADVISED WE HAVE CREATED THE PLANET ALPHA-ALEPH. IT IS BEAUTIFUL AND GRAND. WE WILL SEND OUR FERRIES TO BRING SUITABLE PERSONS AND OTHERS TO STOCK IT AND TO COMPLETE CERTAIN OTHER BUSINESS. OUR SPECIAL REGARDS TO DR. DIETER VON KNEFHAUSEN, WHOM WE WANT TO TALK TO VERY MUCH. EXPECT US WITHIN THREE WEEKS OF THIS MESSAGE.

Knefhausen read it over twice, stared at the President

and read it again. "I . . . I am very glad," he said inadequately.

The President snatched it back, folded it and put it in his pocket, as though the message itself was the key to power. "So you see," he said, "It's simple. You help me, I help you."

"Yes. Yes, of course," said Knefhausen, staring past him.

"They're your friends. They'll do what you say. All those things you told me that they can do—"

"Yes, the particles, the ability to reproduce, the ability, God save us, to build a planet—" Knefhausen might have gone on cataloguing the skills of the spacemen indefinitely, but the President was impatient:

"So it's only a matter of days now, and they'll be here. You can imagine what they'll have! Guns, tools, everything—and all you have to do is get them to join me in restoring the United States of America to its proper place. I'll make it worth their while, Knefhausen! And yours, too. They—"

The President stopped, observing the scientist carefully. Then he cried "Knefhausen!" and leaped forward to catch him.

He was too late. The scientist had fallen limply to the duckboards. The guard, when ordered, ran for the White House doctor, who limped as rapidly to the scene as his bad legs and brain soaked with beer would let him, but he was too late, too. Everything was too late for Knefhausen, whose old heart had failed him . . . as it proved a few days later—when the great golden ships from Alpha-Aleph landed and disgorged their bright, terrible crewmen to clean up the Earth—just in time.

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