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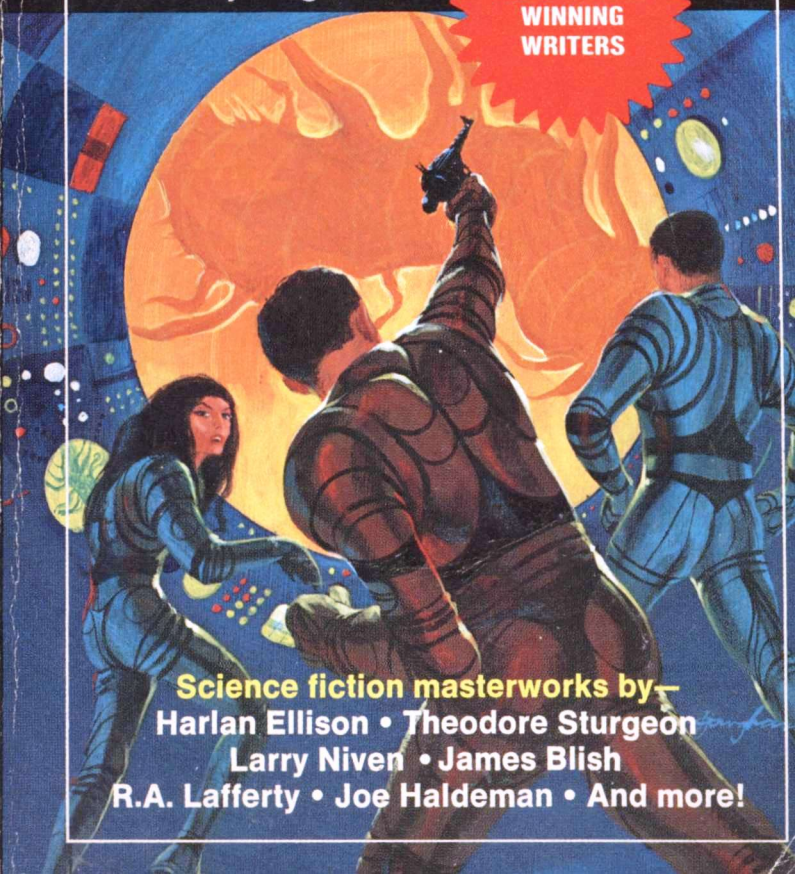

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The Editors of Galaxy Magazine

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NECESSARY AND SUFFICIENT

By Theodore Sturgeon

Despite the increasing sophistication of computer technology, the troubles of the world, largely caused by man, are still being solved by man. Theodore Sturgeon, long one of the most eloquent defenders of the need for the imperfect human being, presents a most engaging story about the human problems of a professional problem-solver.

I

MERRIHEW WAS A TROUBLESHOOTER. THERE HAD NEVER been one like him, so there was no name for what he did. Dr. Poole was head of the Institute, mostly because he could sense trouble before it happened. Sensing it and doing something about it were two different things. Merrihew could do something about it. His record was most confidential but his batting average was high. Incredibly high.

And you wouldn't have thought so to look at him.

Dr. Poole had called Merrihew and they had met for lunch. When the waiter went away with his order Merrihew wanted to know the name of the trouble.

"Lasvogel," said Dr. Poole. "Look, Merrihew, we have a chemistry section here—three, really, if you figure inorganic and bio and organic as separate, which they practically are. Then there's electron physics and computer design and the mechanical section and the socio think-tank and some other stuff. And if Lasvogel wanted to call himself section head of every one of

them he'd have the right. Only it would look funny on the organization chart—and anyway he wouldn't want it."

Merrihew said, "That's who he is, not your trouble."

Dr. Poole wagged his big white head. "Oh, Lasvogel's the trouble all right. He's coming apart."

"Eggs in one basket," Merrihew said. "All those departments with the head lopped off?"

"All those departments could struggle along just fine without him. Emphasis on struggle, maybe, but—they'd make it. It's the West Ecuador thing. Actually I don't mind if he cracks up after he's solved that one—he's earned a good breakdown. I just want him to hang together until then."

"What's the West—"

"Quiet." The waiter came, put down drinks, went away. Dr. Poole was studious with ice cubes for a moment. He made a motion with his head that brought Merrihew leaning closer.

"Code name. It isn't Ecuador and it isn't West—and if you can do your work without knowing where it is, all the better. If Lasvogel can stay with it until he finds an answer you may never find out—and that's all right."

"How much longer does he need?"

"I wish I knew. Oh, I wish I knew. It could be tonight, tomorrow. It could be weeks."

"Or never?"

"Don't say that," Dr. Poole made a terribly controlled warding-off gesture. "Don't even think it."

"And there isn't anyone else who might—"

"No there isn't. Or maybe there is, but the only way to find him would be to describe the problem—and I can't do that."

"Better do it, though."

Dr. Poole gave him a long, sharp look. The waiter came with the salads, fussed about, went away again. "All right then," said the director of the world's quietest and most extraordinary consulting company. "Over-

population. Everything comes down to that. Too many people. Not just pollution but geopolitics—nations looking for room to expand. Businesses—they overbreed too—looking for markets. But the trouble is also too many kids in the classroom—a solitary man looking for some place to walk where it's wild and quiet. There are other problems besides overpopulation, but if we can whip that one we can whip them all."

"Better hurry," said Merrihew.

"Yes, of course. Of course: I know what you mean. It's already too late for some things. A whole ocean could die if we controlled population by tomorrow night. But you see, that's what we've done. What Lasvogel's done."

"You lost me."

DR. POOLE looked to right and left and leaned close again. "The place we call West Ecuador has the highest birth rate in the hemisphere. Or almost." he added. Maybe the hedging words were a scientist's exactitude and maybe they were a little something to keep curiosity at bay. "We have ways of keeping day-to-day tabs on it, primitive as it is. Every doctor, every clinic in West Ecuador is feeding our computers, whether any one of them knows it or not. We can even get the midwives, about five-eighths of them—much more than half anyway. We've been setting the place up for an experiment for a long time. You don't much approve of a tactic like that."

"I didn't say anything."

"Most people wouldn't approve. High-handed, undignified—I've heard all the names for it. I also know all the preachments about means and ends. We're doing what we're doing because we haven't been able to find another way—and because something has to be done now and not when we can do a public-relations job and then put it through the courts. Little kids with blown-up bellies, toothpicks for arms and legs and sores all over—yes, we're doing it for them. But also because

West Ecuador is a preview. The whole world is going to be like that—not might be, is going to be—if something isn't done *now.*"

Merrihew put up both hands in a way that said, *Well, all right, dammit.*

"We threw it to Lasvogel," Dr. Poole said, "and he came through." He added a little anxiously: "Lasvogel always comes through. Anyway, his treatment batted a thousand on a hundred and twenty-three cases. Injections. Not one of the recipients got pregnant. No side effects. I know what you're going to say," Dr. Poole added quickly. "Nothing new, eh? That Swedish pill, take it tonight, get your period tomorrow whether you've conceived or not? Wait—there's more."

Merrihew sat silent.

"Lasvogel's whole approach was different," Dr. Poole continued, "and that's all I'll say about it—except his preparation is more potent than you'd believe. More even than Lasvogel believed. We did a mass treatment. Well, I'll tell you: we had a prevailing wind situation and we did it with a chemical fog. Lasvogel—we—we figured it might affect some women in a nearby city to some measurable extent. As I said, we've spent a lot of time and a lot of money setting up observation posts. We were looking for a decimal point and maybe three zeros before we came to a number—no more than that."

Dr. Poole sat and wagged his head. It looked for a while as if he had forgotten what he was saying, forgotten his lunch and his quest, forgotten even this tumbling urgency. Then he asked, "In five weeks, in a population pushing two million, know how many pregnancies we recorded in West Ecuador?"

It was not Merrihew's style to respond to rhetorical questions. He simply waited.

"Seventeen. Seventeen, in five weeks."

"Wow." Merrihew cut steak, forked it up, lifted it, looked at it, put it down. "Wow." Pollution, belly bloat

and toothpick legs, war and pestilence—and cold greed is emperor: survival is greed. And then—how had Dr. Poole put it?—a solitary man walking some place where it's wild and quiet. Merrihew had time to get a glimpse of a man like that in a place like that and think that it might after all be that way while Dr. Poole had to go and say, "They were all white."

MERRIHEW HADN'T gotten to be what he was by being uncool—and it could be that he looked the part. But once in his life a flashbulb had gone off in his face in a dark room and once someone he had loved had died in his arms and once he had had to blow the whistle on the best friend he ever had, who died of it. This thing he had just heard was like all those at once; it made him bite his tongue the same way. It could be that he heard nothing at all for a long moment because he didn't want to hear anything else; he wanted to tip time backward and not know what he had just been told. He came back slowly—as if someone had a volume control to bring up sound gradually from silence—and heard Dr. Poole say something about cloud formation.

"There's a central mountain range and, like all such, it has cloud cover most of the day. Lasvogel thinks the chemical fog went in over the city and upslope on a thermal current. He really had no idea the stuff would work in dilutions like that, but it did. When it got to the cloud it dispersed right through it in a few hours—well, he had anticipated that part. Then, of course, it rained. It rains every day in that place for a little while. It was the rain that brought it down on the lee side—so, you see, the whole place was covered.

Merrihew recognized a flicker of surprise in himself when he tried his voice and it worked. "Anybody live in those mountains—or are they all in the city?"

"I see what you're thinking," Dr. Poole said. "Maybe we missed someone. Well, forget it. Yes, there are villages and small holdings all through the area. But

you've got to accept what I said: we've had the whole place bugged for years now—crossroads clinics, private doctors, the pathological labs and the midwives. Trust the figures."

"How big is the white population?"

"Less than five percent. Two couples from the Peace Corps who settled there, some teachers and doctors, business people. Also some East Indian settlements and orientals. No pregnancies there either. Just Caucasians."

Merrihew's steak was cold. He put his fork down. "Too big to get hold of all at once. You're taking a hell of a chance telling anyone about this. Even me."

"Stick that in your cap for a feather. The record says you can be trusted."

Merrihew looked him in the eye. "Nobody can be trusted with this one. All I can do is the best I can. Let's get back to work."

"Work? Ah. Your part in this, you mean. All I can tell you is what needs to be done and let you take it from there. I can't tell you what to do." He smiled briefly. "From what I hear, nobody can. That's how you work."

"Lasvogel," Merrihew said tersely. He meant, *Get to the point.*

"Very well. Lasvogel is the key to everything. He's on the track of an answer and he will come through—although maybe I say that because I have no alternative. But I'm afraid he won't last the stretch. He's under some kind of pressure that's brought him to the breaking point and I'm scared."

"I'm scared just hearing about it."

"Oh, you don't understand. It isn't West Ecuador. I know the man. I've seen him under stress—work stress—before. This is something different. Something outside. It isn't physical—I have the right to order an examination and I did that, though I thought he was going to spit in my eye. All I got out of that is what I already

knew—he's under stress. Dr. Genovese—the Institute head medic—laid it to work pressure and told him to ease up, told me to ease up, too. But I know better."

"How?"

Dr. Poole almost shrugged, almost gestured, barely shook his head. "Call it intuition. Call it my special talent the way you'd call Lasvogel's problem-solving a special talent. We give things names and think we have answers. They aren't answers but sometimes they make us feel better." He drew a deep breath. "Anyway, your problem is Lasvogel. Find out what's cutting him up and give me an idea of what can be done about it. Your problem is *not* West Ecuador. He'll handle that. Here." He removed an envelope from his breast pocket and handed it to Merrihew. "Here's a personnel profile plus all the addresses, telephone numbers and peripheral information you can possibly need. Numbers you can reach me twenty-four hours a day—and don't hesitate on that one. A drawing account. It doesn't say so on the paper, but believe me, it's open-ended. And I've bothered to write one thing down in red: *Respect Lasvogel's privacy.* He's obsessive about that. He must never have the slightest suspicion that you're on the job or what the job is. I can put it to you this way: he's the most totally devoted and conscientious man I have ever met, but if he thought he was being spied on, he'd quit the Institute—West Ecuador and all. The only other thing I have to say to you is something that doesn't need saying: God help us if West Ecuador goes on much longer the way it is. Already there will have to be a wrinkle in the birth statistics that some sharp eyes will pick up. Imagine nine months from now when the news gets out that there's a place where there have been no non-white births in a population of two million. You feel all right, Merrihew?"

Merrihew stood up. "I feel we've been sitting here too long. Talking too much."

"But—"

"You said it was all in here," and Merrihew tapped the envelope. "You better be right." And he ran out.

II

SLIT-EYED, thin-lipped, Merrihew went straight to a place he knew and began to work.

The place was a park bench off the mall, in a little hollow over-arched by linden trees. Aside from turning pages from the envelope, which took him less than twenty minutes, he sat motionless, legs splayed out, eyes all but closed, for nearly two hours.

There were things about this job which ran 180° out of phase with the way he worked, the way he thought. Don't think of exactly where West Ecuador is, what it is (although "prevailing wind situation" and "central range with cloud cover . . . it rains every day there" and the population and birth-rate figures put a pin right on its map); don't think of the nature of that fog and its power in incredible dilutions like that and just what that stuff has to be; it was Lasvogel's job to work with that—and anyway, Merrihew genuinely doubted that any wild inspiration of his could even approach Lasvogel's grasp of the variables involved. Don't think of ways and means of discovering from Lasvogel himself what it was that was pulling him apart. Superbrain he might be, but Merrihew doubted he was so unlike other human beings as to be always aware of what was wrong with him. He probably didn't know.

Merrihew liked to work with cross-checkable facts, and with the truth (whatever, from time to time, the hell that might be. In this case he had to work with "meta-facts" and treat them as if they were axioms, knowing perfectly well they weren't. For example, Lasvogel was the only man who could solve the West Ecuador mess. Merrihew doubted that, but could not let that doubt dilute his efforts. And this one: the West Ecuador mess can be solved. Merrihew doubted this too, but must refuse to let that thought into the gears.

And this: the difference between Lasvogel's ability and inability to solve the West Ecuador problem lay in keeping him from falling apart. Merrihew was perfectly aware that Lasvogel might well solve the problem before he, Merrihew did anything; or that he, Merrihew, might pass a miracle and restore Lasvogel to soundness of mind and soul and still Lasvogel might not be able to find an answer.

So all his reasoning and actions must spring from this sequence of assumptions and almost-facts as if they were the word of God, or at least Moses. On top of which, whatever he did had to be done instantly and effectively, for literally every second made it more likely that the news would get out.

The news would get out . . .

He stirred uneasily on the bench: he squirmed. Just the fact—no details, no hows or wheres—just the terrible fact that someone had a substance that would secretly and painlessly sterilize everyone on Earth except Caucasians. Who wouldn't jump at that—jump in horror, in greed, even in joy, in terror? It wouldn't matter what details were lacking: that which is stated as possible is done. A microscopic amount of uranium is split leaving its streaks through a half cupful of smoke, and once the news is out, the thing is done—years later, perhaps, billions of dollars, hundreds of thousands of man-hours later, but it gets done and the world is never the same again. A man drops dead, seated at his desk. There is a bullet wound. There is a hole in the window glass. The detective draws a line from a man's head, as he sits at the desk, through the hole. Ballistics experts alter it to the correct parabola and learn where the gun was that fired the shot—and so on—until a murderer is captured. Let it be known that a thing has been done and it will be known how it was done—if anyone cares enough.

And who would care enough about what had happened at West Ecuador? Blacks and bigots. Clever-mouthed haters, masking their diseased passions under

a cant of believable ecology. And if a weapon so potent and so selective could be analyzed, why couldn't it be made to select another target? And if that proved impossible, was there any way to measure the range of the target now established?

Merrihew had a thought—permitted the thought—purely to know he had had it and that he had eliminated it. Take it to the military, to a wealthy bigot, to the potential victims of the most horrifying exercise of genocide known to history—even human history. One might say conscience would dictate something like the last course—as for the others, there would be fortune incalculable, power immeasurable for a man who held what he had and used it for his own ends.

Merrihew shuddered and spat.

Work. Work. Get to work . . .

He sat there for another twenty minutes.

"For God's sake," he said then. "What a way to save the world."

IT WAS all very discreet, of course, and in the delicate mention of it in Dr. Poole's envelope, the words had all but blushed. The fact sheet held a strange mix of the old-world disapproval and latter-day acceptance, combined with an arch appetite for gossip. What it came down to was that Lasvogel had, in addition to a cerebellum, some gonads, and that these had been preoccupied for some time by one Katrin Szabo, expatriate Hungarian, twenty-four years old, a mathematician employed by the Institute and living in the same apartment house on the same floor as Lasvogel. "His association with Miss Szabo," said the fact sheet primly, "is regarded strictly as Dr. Lasvogel's concern and not the Institute's business"—thereby making it Merrihew's.

What a way to save the world . . .

Merrihew, having carefully checked the whereabouts of the parties involved, went to the apartment house where Lasvogel lived, repeating to himself like a man-

tra: *Lasvogel's privacy must be respected. Lasvogel's privacy must* ... Oh, he didn't give a damn for Lasvogel's privacy. Not now. What the mantra meant was that Lasvogel must not be underestimated. A mind that could do that many things in that many fields was one that would pick up the slightest trace of spying—and that one trace would blow the whole bit. Merrihew could hardly contain West Ecuador in his memory—he most certainly did not want it on his conscience. Anything he did in this operation would have to be by remote control. Anyone he moved or diverted must be handled invisibly and without touching.

In an alley—not the one behind the apartment house—Merrihew become a telephone repairman, locked his car and went into Lasvogel's building through the service entrance. The lock on the fire tower was a simple matter for him. Trudging up eight flights of stairs was not. He used the simple rhythm of climbing to reinforce his mantra.

The eighth-floor hallway was deserted and had an admirably soft carpet. He ghosted up to the door of Apartment 8K and tried the knob, recalling a nightmarish time he had once had picking a lock that wasn't locked. This one was and it was a good one. He glanced at the key slot and from his belt drew out a flat case, opened it. From one side he took out the correct blank and slid it into the slot. From the other side he selected an array of flat blades, chose one, and gently thrust it into the special recess in the blank, applying turning pressures, forward and back, as he did so. His sensitive fingers told him which serration on the blade moved which tumbler and how much. He withdrew the blade and tried another. The third one did it and the door opened. He went in and closed it quietly behind him.

Soundlessly, he whistled.

Nobody, but nobody, could be this neat.

Carefully, avoiding the rugs where possible, he trod

the whole place, the whole bare minimal totally efficient place.

Here was where a man could keep his changes of clothes, could wash, could sleep (alone), could eat if he wanted to but usually didn't. Here he apparently did not relax, did not entertain, did not read or watch TV (there was none) and did not even study. Well, a man like Lasvogel probably did all his studying in his head. He didn't need books, and if it was facts he wanted, he had two telephones. The one with no number on it was certainly an open line to the Institute.

Merrihew found nothing out of place, nothing not strictly Lasvogel's, except the note on the dinette table.

It was triangular, blue, dated, and cuter'n hell:

Welcome, welcome, wherever you
are. Problem: to make perfect
beef Stroganoff exactly as
you like it, without know-
ing when you'll come.
Need one ingredient:
Dearest you.
Waiting,

LEANING OVER the table to read it without touching it, Merrihew noticed the funny little crossbar on the 7 of the date, European style, and could admire the firm, strong, straight, yet completely feminine handwriting. He backed off a pace to look at the note from a distance. From the way it was placed on the table, he had a strong feeling that it had not been read and tossed there. It had been so carefully centered most likely by the sender, not the receiver.

And the date?

Yesterday.

He continued his hands-off inventory: bathroom (where he detected moisture not only on the toothbrush but on the soft bristles of an old-fashioned badger shaving brush) and in the tiny kitchenette, where he made his big find.

It—they, rather, were in the cupboard over the chopping block. The small spice rack contained salt, pepper, seasoned salt, seasoned pepper—and that was all. Beside the rack was an array of vitamin capsules—B complex, glutamic acid and the usual vitamin-mineral once-a-day pill. What faintly caught his eye, just as he turned away, was a glimpse of something stashed behind the little spice rack.

Feeling that perhaps he was carrying caution to a ludicrous extreme—yet silently chanting his mantra again—Merrihew got out his needle-beam torch and peeked. He had to be mildly acrobatic to be able to read the labels, but what he found was vitamins—two bottles. One was B complex and iron, the other Vitamin E. Unlike the B complex out front, which bore the name of a reputable drug-store chain, these hidden ones were from *Let's Live!*—one of those natural-food emporia of which Merrihew, a confirmed carnivore, once had said, "They sell fruits and nuts to the nuts and fruits." It happened that he knew this one; it wasn't far from his office.

What the hell was Lasvogel doing in a place like that? And why should he have bought more when he already had had (Merrihew bent to check) two thirds of a bottle of B Complex? And if Lasvogel were simply storing this new bottle—why wasn't the Vitamin E out front?

It looked almost as if he had hidden them.

Resisting the temptation to find out if the bottles really were the genuine article—for the screw-on caps were sealed with shrunk plastic—Merrihew turned away and scanned the counters, the minuscule stove. In the wastebasket was a piece of paper—a small bag with the colophon of the *Let's Live!* store on it. Merrihew's eye photographed just how it lay before he reached down and took it by the smallest possible corner and lifted it out.

Handwriting.

One of these you really need.
So much better for you.
Please take them. The other.
one you don't need at all (!!!)
Please take them anyway!

Love and love
Ruthie

Merrihew replaced the crumpled bag in the waste-basket precisely as he had found it, took one more careful look at the whole place and let himself out.

In the envelope Dr. Poole had given him there was no Ruthie. Hm.

He walked softly down the hall, checking his watch. Still plenty of time. He let himself into Apartment 8D rather more quickly.

APARTMENT 8D was much more to his taste. In its way as well ordered as Lasvogel's, it was warm, colorful and lived-in—lived-in, too, by someone who could own a green glass pear and the portrait of a smiling collie because they were beautiful and not because they did anything. The kitchenette was no larger than Lasvogel's but marvelously equipped and organized. The bed could sleep two and the presence of drapes and spreads, rugs and cushions had eliminated that acoustically-live effect Lasvogel's place generated, wherein one's very thoughts echoed and there was nothing to absorb a human error. Merrihew, while retaining his detachment, could not control the thought that if Lasvogel was throwing this away he ought to have his glands candled.

Against one wall was a drop-leaf table, serving as a desk but ready to be used for meals. It bore at the moment a block of triangular notepaper, blue. He ran a fingertip lightly over it edges and nodded. Practical, too. This was Institute stationery with the letterhead guillotined off (making a square) and cut again on the diagonal, making that charming triangular paper.

A piece of it lay on the desk, a felt-tipped pen next to it. In the strong feminine handwriting he had seen on Lasvogel's table, he read:

Actually I have no claim on you in
any way, not even in the simple
matter of expecting promises
to be kept, and there is ob-
viously no reason for me
to oh, damn, what's the
USE . . .

The last words sprawled across the paper—he could see where the violent pen had run clear off onto the table top.

Merrihew's eyebrows twitched. Time was when he might have raised them. This was obviously the end of a long series. The rest should be—ahh.

The wastebasket was half full of them. The ones on top were unruffled, the ones lower down crushed, the ones at the very bottom torn into little bits or twisted into tight little knots.

It must have been a long night.

He sampled the many drafts.

Cheerful: *Hello there! Remember me? I'm the one with the secret vice—elaborate beef Stroganoff alone in my room. This could lead to—*

Indignant: *It may be that there are things in your life far more important than—*

Comic: *HELP! I am a prisoner in a Stroganoff factory!*

Comitragic: *To whom it may concern: I am an orphaned beef Stroganoff. Nobody wants me. My noodles are withered and my gravy cold.*

Tragicomic: *Oh pity the poor mathematician with her shining hair brushed bright and the bed turned down, the wine untouched and the Stroganoff cleaving to the cold old chafing-dish—*

Distraught: *Perhaps I needed this. In no other way*

could I have learned how much I want you, need you. It's so much more than mutual pleasure and the joy of your nearness. I should be angry but instead I'm grateful, but oh, it hurts—

Furious: *You rotten bastard, you icy son of a bitch, whatever gave you the idea you could treat me like—*

Maternal: *Nothing matters if you're all right, my dear. There will be other times—any time you say—or none. If I can help in any way, I'm here. If I can help most by leaving you alone while you work things out, I'll do that. But I am rather desperately worried about you. Please eat.*

"Bastard," Merrihew murmured as he carefully replaced the papers in the wastebasket.

It must have been a long night.

III

HE WONDERED if she had used her key and how often, "her shining hair brushed bright—" she had run down the hall to that monkish cell, only to find it dark and silent and her welcoming note unread on his table? Had she dozed off some time in the early hours and awakened, stiff and cramped at her writing table, to run down once more and perhaps done as Merrihew had just done—checked the untenanted cot and the damp toothbrush, realizing that Lasvogel had come home in the gray light to wash and change and leave again—smelling probably of another woman's perfume? Smelling of organic soy sauce and sesame seed, rather. Who the hell was Ruthie?

What was a guy like Lasvogel, with the fate of a whole planet in his hands, doing with two absolutely superfluous time-consuming body-and-mind-consuming entanglements like this.

Merrihew thought about those organic vitamins.

One of them you need . . .

That would be the B complex. These health nuts

were ape for B complex and the synthetics just would not do.

. . . you don't need the other one, but take them anyway.

Oh, boy. There used to be a whole megillah about the language of the flowers, you'd send irises and a rose and a hunk of Queen Anne's lace and it meant I am panting for you, or some such. Nowadays you bring a bottle of pills.

You don't need these (!!!) . . .

Oh, this Ruthie, she is a cutie. Everyone knows Vitamin E's the wildest thing since the prairie oyster and Spanish fly. Lasvogel, you busy, busy boy, you. So you have a date with this Hungarian slipstick and her Stroganoff and instead you're out all night with your dish of yogurt and her triple exclamation points—and you with all that homework to do. And you bring home your trophies and hide them because you know the other chick has a key.

And suddenly Merrihew knew what he must do. He knew it as he knew that he must do it absolutely invisibly.

He had not the compunctions, here in Katrin Szabo's apartment, that he had had in Lasvogel's austere environment; yet when he used the telephone he was careful not to move it and to hold the receiver with his handkerchief. He got his number.

"Let's Live!" said the telephone.

"Hey man, amen," said Merrihew, who hated people who said "man!" "Is Ruthie there?"

"You mean Ruthie Gordoni."

"Godbless, man." *You just told me what I wanted to know.* But Merrihew didn't say that last part out loud. "Look around and see is she there for me, man."

A pause, then: "Not here. Wish she was," the telephone added garrulously. "This is a whole different place when she walks in. Someone said just last night she's a regular Earth Mother."

"Far out," said Merrihew, who hated people who say

"far out." "She's the one turned me on to your B and liver. I wanted to find her and thank her, man. I'm really somebody different, man."

"That's Ruthie," said the telephone with pride and joy. "Well she lives right across the street, so she'll be in. Who shall I say—"

"I'll fall by myself soon, man. I'm never out of porkfat molasses anyway."

"Blackstrap."

"That's what I said, man. So later, man."

"Right on," said the telephone fashionably and Merrihew hung up. He glared sourly at it. "Far goddam out, man," he murmured and went looking for the phone book.

He found what he wanted and then, pausing only long enough to check out the whole place for his spoor and finding none, he let himself out and returned through the deserted hallway to Lasvogel's door, which he now opened in even less time than he had the girl's. He was there only long enough to fish the *Let's Live!* bag out of the wastepaper basket and, in an absolutely perfect copy of her handwriting, add the earth mother's last name and street address to her arch little note. He did not, however, put it back. He left it on the floor beside the basket. In that environment it shouted, it screamed, it stood out like an oilspill on a talcum beach.

He went back to his office and called Dr. Poole. "Finished," he told that startled gentleman. "I got to tell you this: he'll get worse before he gets better—and if you try to do anything about it you'll screw everything up. And if you call me to tell me bad things have happened to him I'll just say I know, I know."

Dr. Poole said, "But—"

Merrihew was already saying, "Goodbye."

He then went where phones couldn't reach him for a while.

What a way to save the world.

THE WAITER went away with the order and Merrihew shot a look at Dr. Poole. He looked older, a little, though it had been barely three weeks since the last time. He also looked a hell of a lot happier.

"I can't tell you exactly what he did, of course," said Dr. Poole.

Merrihew nodded understandingly.

"Secrets, secrets," he said.

"Nonsense, man! There are two kinds of secrets—the security kind, where someone mustn't find out something or you'll get hurt—and the other kind, where you're expected to explain polymer transformations to a four-year-old. You just *can't*. So as one four-year-old to another, I can merely bumble to you about DNA analogs, a chemical integument forming temporarily around ripe ova, selectivity rather like the clumping that forms sickle cells—and an overlooked environmental factor."

"You mean there's no smog in West Ecuador."

"Jesus! How did you know that?"

"You told me. Most of it at lunch that time. I mean, West Ecuador could only be one place in the whole world, from what you told me. And now you mentioned 'an overlooked environmental factor.' "

"Ah. Ah." Dr. Poole nodded vehemently. "Good thing we—he cleared it up as soon as he did. Anyway, it's reformulated completely and if anyone should ever make the same mistake again we can straighten it out in a matter of hours. To put it as simply as possible, we now have something which nullifies conception in any warm-blooded vertebrate—but only for the current cycle. It doesn't affect the cycle either and it has no side effects. It can be taken as an individual dose or fogged—the way we did it at West Ecuador—to affect millions. We can bend the population curve downward anywhere—to any degree."

"And now who gets it? Government? U.N.? Or just you?"

"You don't want to know that."

"You're right."

The drinks came. Rather happily they silently toasted one another. "Now," said Dr. Poole, "tell me. How did you do it? Matter of fact, what did you do?"

"Maybe I should keep my secrets, too."

"There are two kinds of secret," Dr. Poole reminded him.

Most uncharacteristically, Merrihew laughed. He did not do it very well. Not enough practice. *"Touché.* Un—I drew a hell of a slice out of that account you set up. I wouldn't want you to regret paying out all that money for the little I did."

Dr. Poole waved that away. "There's an old story about a mechanic who fixed a big rotary printing press by going inside and whacking something once with a hammer. He billed for $2500.25, and when they asked for an accounting and itemization, he said the quarter was for whacking it with the hammer. The $2500 was for knowing where to whack."

"Goddam," said Merrihew. "I was going to tell you that very same story."

"Tell me what you did."

"I studied your envelope pretty carefully. Your Lasvogel shows an interesting pattern. He's a multitalented man—and I don't think his talents are completely under his conscious control. Some people blow up under stress. Some people sharpen up. Lasvogle sharpens. The tougher the problem—and/or the more urgent—the sharper he gets. The West Ecuador problem could hardly have been tougher or more urgent. Every second it got more so. Lasvogel, I think, began to get a little frantic. I think that maybe for the first time in his life he began to feel that the problem wasn't going to produce enough pressure to squeeze out an answer. It began to show."

"Oh, it did," breathed Dr. Poole.

Merrihew said, "I don't for a minute believe that Lasvogel consciously realized why he then did what he did. Which was to go out and get himself another chick."

THE WAITER came, puttered, chuntered and ultimately went away, during which whole time Dr. Poole frowned unseeingly at the puttering and chuntering.

"I suppose," he said when they were private again, "that he needed to get his mind off the—"

"He got a new chick without getting rid of the old one," said Merrihew. "There is in all the world no more certain way for a man to get himself into trouble than that. There's no more efficient method for a man to complicate things for himself, to face more unpredictable and unmanageable hassle."

"And you were able to stop it."

"Haven't you been listening? My God, you know him better than I do or ever will! Lasvogel has total confidence in his ability and he had total devotion to the West Ecuador problem. I mean he knew the answer was in there somewhere and he knew he wasn't getting enough pressure out of the work. Even if it was about to squash him flat it still wasn't enough to make the answer come. So he just went out and bought more pressure."

"Without knowing why?"

"I really don't think so," said Merrihew. "Consciously knowing it would make it game-playing, not real—and the pressures then wouldn't be real either. Which is why playing tricks on yourself never works."

"Incredible. So—what did you do?"

"Nothing essential. What happened was inevitable, so in a way you didn't need me at all. On the other hand, I did make the inevitable happen a hell of a lot sooner, which is why you got your problem solved when you did."

"Why we got it solved, period," Dr. Poole asserted warmly. "Lasvogel was at the bitter end, believe me."

"You'd know," conceded Merrihew. "I don't—I never saw the guy. Or the chicks. That was the only real trouble I had—making it happen without touching anybody. So I just did what you scientist types called bringing in a force or factor which is necessary and

sufficient. I saw to it that the two girls got to know each other. I know your Miss Szabo was due home before Lasvogel, and that she would sit down and brood a bit, that she would get mad and barge into his place—and that she would not only see the evidence I left for her but would snatch it up and take it away with her."

"What evidence?"

"The other woman's name and address."

"But how would that guarantee—"

"It was guaranteed, if you know Miss Szabo."

"You seem to have gotten to know her quite well."

"Never saw her," said Merrihew, watching, behind his eyes, a succession of careful blue triangles, lines of strong, angry, devoted, injured handwriting. "But in a way you're right. I knew she'd go straight there and have it out."

"What happened?"

"We'll never know. Whatever it was, Lasvogel walked in on it."

"That must have been the night he limped into the lab with the scratches on his face and the big bruise on his cheekbone."

"Language of love," said Merrihew. "One of 'em."

"And by morning he had the new formulation."

"Pressure enough," said Merrihew, spreading his hands in a Q.E.D. gesture. "Necessary and sufficient."

"Oh, dear," said Dr. Poole thoughtfully.

"What is it?"

"I can't complain, I suppose. I said before—you heard me—that if Lasvogel solved this one he could retire with honor. In effect he probably has—and we won't be getting much from him from now on."

"Why?"

Dr. Poole leaned forward with his I-don't-gossip-but-you-should-know expression. "This wouldn't be a Miss Ruth Gordoni?"

"No," said Merrihew. "Ruthie."

"Ah. Well, Lasvogel has moved, you know. Taken a house. And according to my sources Miss Szabo has

moved in with him. And, ah, Miss Gordoni also. They seem to have become fast friends, all three."

And Merrihew really did laugh, this time. "Friend," he said, putting his hand on Dr. Poole's shoulder, "You're going to get work out of Lasvogel like you never got before. And he's still got a lot to do if the totalitarian principle of physics inherent in this mess is to be kept permanently at bay. It goes something like this: 'Anything not forbidden is compulsory . . .' He's found a way to keep the pressure on and an environment that won't even let him get sick. Beef Stroganoff with Vitamin E sauce—" and he dissolved into laughter again and wouldn't explain.

GETTING TOGETHER

By Milton A. Rothman

Of the many robot stories written thus far, few deal with the emotional problems of sentient robots. Onestone, the creation of Milton A. Rothman, is reaching a crisis in his short career as a metallic being in a flesh-and-blood world. Faced with ultimate loneliness, he must turn to man for help.

LIFTED TOWARD the ceiling by a score of hands, Onestone felt as though he were standing on his head prior to rocketing toward outer space. When they gently laid him on the floor he felt sorry that the experience was over.

"Oh, wow," he finally said. Then he lay still for a while.

"You see," Jay Foreman said gently. "We can be trusted. We could bear your weight and we didn't drop you."

"That is true." Onestone bent his waist and sat up. "But can I extrapolate to the future? What happens when I leave this group? It will be the same on the outside as it was before. They'll still hate me."

"I'm so exasperated I could scream," sputtered a big woman called Jennie, whose full breasts hid behind a long veil of black hair.

"So scream," said Onestone.

She screamed. "There, that's better," she finally gasped. "But you're still exasperating. You use words that are too big. You intellectualize all the time. You put me off with that cold, cold voice of yours."

"What do you want from someone with my background?" he asked bitterly.

"Hey!" Hairy Bill rose to his knees. The front of his body was a shag of black from his full beard down. "Old Onestone practically sounded bitter. Maybe he's getting somewhere."

"Yeah, he used some feeling there."

"A little honest emotion."

An excited jabber circled the group and crashed onto Onestone, who sat on the mat in the center.

"How would you like to do some role-playing?" suggested Jay Foreman. "You be the son and Bill here will be the father. Come on, Bill, get in the middle and sit facing Onestone. Let's try to get a father-son thing going."

Bill crawled over and squatted. "Hello, son," he said, affecting a kindly voice while trying to suppress a feeling of ridiculousness. "How was school today?"

"Okay, Dad."

May, a tall blonde, tittered. The whole scene was so weird!

"We learned inversion of matrices today," Onestone plunged on bravely. "I can't wait for us to do things together, like going to the Computer Center. Gee, it's great to have a father."

"Look son, you have your head too much inside the console. You should get out more and play with the other kids in the block."

Onestone slumped. "That wouldn't be any good. They wouldn't play with me. I'm too different. I'd beat them at chess all the time and—"

"That's the trouble," Bill shouted. "I say play with the kids and you say chess. All you think about is your head. You have a body, too. Become aware of it. Don't you have feelings in your body?"

"Why, sure. I can feel temperatures with my right index finger and voltages with my left. I can feel how far my elbows and knees are bent. And orientation—up and down, north and south."

"But—" There was an interruption from Bald Bill, the football player, two meters tall and roughly as wide, completely devoid of hair from top to bottom. "If somebody tackled you across the knees you wouldn't feel a thing. And he'd probably break his neck. Just how strong are you, anyway?"

Onestone shrugged. "Compared to humans, I have no idea. What does it matter?"

"One thing you don't know about humans," Bald Bill told him, "is that they are always comparing each other. Always measuring and testing. I see a strong guy, I want to know if he is stronger than I am."

He stared a challenge into Onestone's face.

JAY FOREMAN shuttled his eyes back and forth between the two. "We can settle it with some arm-wrestling," he suggested. "You don't have to if you don't want to, Onestone, but remember that one of the things we are trying to deal with here is your lack of aggression and inability to feel anger. Arm-wrestling is a non-violent way of combat, a test of strength and will."

"But I don't know about fighting. What if I hurt him?"

"You can't hurt him with arm-wrestling," Jay explained patiently. "Look, you lie down facing each other, put elbows together and then you try to push his arm down flat on the mat."

Bald Bill flattened himself into position and raised his arm from the elbow. "Come on, you brainy son of a bitch, let's see what you can do."

Onestone, still on his knees, looked around the group, wanting someone to intervene.

"Why does he insult me like that? I was conditioned never to be hostile to humans."

"Oh, you dumb ape," Hairy Bill groaned. "You still don't understand what the score is. You're so damn inhibited you can't feel hate, love, anger. How do you expect to be accepted as a human being? You have to learn to feel human emotions."

"Come on, you obscene artifact," Bald Bill taunted deliberately, reaching out his hand. "You can't hurt me, you stupid automaton."

Stung, Onestone drew back. Words could hurt, after all. Somewhere inside him pain glimmered dimly. "All right, you dumb athlete," he muttered, and got down on the mat.

The two locked hands and stared into each other's eyes. The dim light from the lamp in the corner glistened coldly on Onestone's stainless skin. Bulk for bulk he and Bald Bill were evenly matched, but the construction was different. Onestone's surface was polished, smooth as a Brancusi sculpture. Bald Bill's skin glowed a fine pink; hard muscles, tensed for the combat, rippled under the thin surface.

"Go!" Foreman started it. Instantly Bald Bill's face flushed crimson and the veins on his forehead popped out like writhing worms. His shoulder muscles stood out rigidly as his eyes drilled all the way into his opponent's.

The sudden violence of the attack caught Onestone by surprise. His arm was halfway to the floor before his torque adjusted to counter the motion. Bald Bill dug in and searched within himself for another measure of power to complete the job, but to his amazement he felt his arm relentlessly forced back to the vertical and over. His face twisted. Sweat ran from his body. A growl rasped from his throat.

Inside Onestone strange new feelings stirred—anger in response to the growl, excitement at the close body contact, determination to dominate. He advanced his torque another notch and closed the gap to the floor. Bald Bill collapsed, panting.

Onestone lay motionless, sorting out the torrent of new sensations. Joy at winning a contest. Affection for a defeated opponent. Sorrow for the vanquished.

"Where are you now?" Jay Foreman asked, softly.

"I really felt something there. I felt something that wasn't just solving problems or doing logic. It could not

be expressed as numbers, forms, equations, or colors. The sensation was unpleasant, but it was exciting."

And for the first time his voice broke out of its monotone and sounded excited.

"OH, WOW!" Marian, a small girl in her late teens, burst violently into tears. "He felt a real emotion. He broke through."

Every one of the ten group members behaved as though a cold wind had blown briefly across his perspiring skin.

Onestone turned to Marian. "But why do you cry?"

"Oh, you dumb contraption," she wailed. "How would you know? Don't you know that we can cry from happiness—or we can cry at perceiving an emotion in another person, from empathy? That's what makes you so frustrating to talk to. We don't get any emotional feedback from you. I'd like to hit you."

She crawled across the mat and proceeded to beat on Onestone's stainless-steel chest with a pair of futile, tiny fists. Suddenly the thought came to Onestone that he would like to embrace Marian with his arms. Startled, she began to draw away. But he gently drew her close and, kneeling on the mat, they remained for a long minute close together.

He thought to himself that his skin ought to be covered with soft padding, and temperature and pressure sensors should be placed under the outer integument, so that he might obtain more physical sensation from the close proximity of a human being. But even now, just the thought of the experience was pleasurable.

At a signal from Jay Foreman the rest of the group stood up and formed a circle around the pair. Slowly they drew closer to the center until all ten were in a huddle, nestling Marian and Onestone in a close embrace. As though it had a mind of its own, the group began to sway gently back and forth, remaining that way for a long time.

Finally the time was over and they reluctantly separated, Marian wiping tears from her eyes and Onestone sunk in deep thought.

"This feels like a good place to stop," suggested Jay Foreman. "The hour is late and we have a lot of learning to consolidate. We have seen that feelings are complicated and our responses to them are not always what we might expect on the surface. Onestone, with his flat, schizoid, unemotional manner, generated frustration and anger in everyone else. He has to learn the meaning of feelings and emotions—and, of course, that is what he is here for."

AS THE group broke up, most of the members went down to the pool to wash off perspiration and then made for the lounge to sit around, drinking and smoking. Unable to enjoy these amusements. Onestone made his way in darkness to a rock overlooking the ocean and watched the starlight bounce off the surf spray. Both his smog and radioactivity sensors showed a clear night. Needing no sleep, he remained where he was for the night, busying himself by trying to reach the end of a complex mathematical calculation that had been troubling him for some time.

As the sun illuminated his back in the morning, Marian approached him and said, "You've done nothing but sit out here all night. And we had so much fun in there."

"I've been enjoying myself. Work is fun—and I've been working. I think I begin to see the solution to an important mathematical problem."

Marian looked around. To her mathematics meant a computer terminal, she did not see a keyboard or screen.

"Oh. You're one of those lucky people who does mathematics in his head. I can hardly add two and two."

"I cheat," Onestone said. "I have a built-in remote connection with a computer unit over there in my car."

Not to mention the radio relay to the central computer utility in San Francisco and a satellite link with the world's most powerful computer at MIT. All available as fast as the speed of light would allow, directly perceived visually and symbolically on a "screen" within his own nervous system.

"Oh," Marion said, as though she understood.

Onestone had learned not to make detailed explanations. The gap between the scientifically educated and the uneducated had grown so wide that there was no way of explaining to a layman what a scientist was doing. Yet Onestone had to learn how to make small talk, to converse about the trivia of everyday life, to understand how people felt about unimportant matters.

"Are you on your way to breakfast?" he asked. "May I join you?"

"Sure. But—ah—you don't eat, do you?"

"No," he replied with a touch of wryness. "But I can stop by my room and install a recharged battery."

Marian watched with interest as he snapped the battery cube out of the center of his belly and clicked the fresh one in place.

"That's neat. But I'll bet it doesn't taste as good as eating breakfast. Let's go. I'm starving."

Onestone glanced at her with alarm, but decided that the primary meaning of "starving" did not apply and searched the thesaurus in San Francisco for secondary and tertiary meanings. He still had much to learn about the tongue, having been raised on computer languages and their clarity and logic, and finding the complexities of twenty-second-century American not to his liking.

The group session this morning took place on a secluded field where the sun soon burned its way through the sea mist and fell hot on naked backs. Onestone decided he had been the center of attention long enough and sat quietly while a tall thin boy named Ken went through a tale of woe concerning his parents. It seemed to be a typical enough story, fitting in neatly with the thousands of cases Onestone had scanned in

the files. Both parents busy, working. When at home father alternated between alcoholic low and hash euphoria. Mother compensated for not taking care of son by gushing affection, alternating with nagging about the boy's sex life.

"Jeez, she was afraid if I didn't get it every day I'd shrivel into a raisin."

"Sounds like she was unconsciously seducing you," suggested Jennie, who had been to many groups and had a good command of the jargon. "Like she wanted some of that action herself."

ONESTONE DESPAIRED of ever getting a real understanding of that aspect of human behavior. He glanced around at the others sitting in the group circle. Their nakedness made the sex differences plain to see—they were just as pictured in every textbook and tape he had scanned. He knew their purposes anatomically and physiologically, yet the great importance attributed to them by these beings eluded him.

Onestone's own body, smooth and hard, with no characteristics of a biological nature, had a pleasing form and texture. The others, with their hairiness, their softness and pouchiness, were not objectionable to him since he had not been conditioned with prejudices against human bodies. And yet, from what he could hear, the humans did have their own prejudices and irrational responses to their own bodies. So much so that coming together in a group like this with no clothes at all was a highly special occasion charged with great significance and emotion. The entire first day of the group had been devoted to discussing their feelings of strangeness, embarrassment, nervousness—while he, Onestone, could only conjure up the usual mild curiosity he acquired in a new situation, since he had actually never before seen naked human beings.

His attention reverted to the center of the group, where Foreman had set up a psychodrama with Ken playing the son and Jennie taking the mother role.

"For Crissake, Mom," Ken was complaining. "Why don't you get off my back? Every night I come home you want to know how I made out. Don't you think that's my own business?"

"Son, you know I'm only doing it for your own good."

"I think you're a dirty old lady. My generation just doesn't think about these things the way you do. We believe in privacy. You're just driving me crazy. You're never home when I need you—and when you are home you keep prying into my affairs and then I never want to see you again. And dad, he was never there at all. He was just way out. All those times when I really needed somebody—nobody home."

Then came the miracle, the strange episode that never failed to astonish and bewilder Onestone when it unfolded in front of his eyes. Ken's face twisted, his shoulders began to shake and suddenly tears were gushing from his eyes and anguished sobs were bursting from his throat. What kind of unknown manifestations arose from the depths of the nervous system to cause such a reaction? Onestone's early training and conditioning had done nothing to prepare him for this type of affair. He had been trained for logic, for problem-solving. His thoughts were always straightforward, on the surface, with no hidden messages contradicting each other.

But with these human beings, messages were always on two or three levels—what they said and what they meant were always different things. If the mother really loved her child—why did she behave in such a way as to make him unhappy? There must be some fundamental reasons for these paradoxes. He could refer to the library files in San Francisco for the latest research on the subject, but he had agreed to stay out of the library during the group sessions, for he had to learn from the humans in the group directly and experientially.

TO UNDERSTAND these human beings meant to learn the

hidden communications, to infer the secret meanings from subtle clues, to make guesses about the thoughts going on in their minds—for there was no way of getting at these thoughts directly. No telepathy, no ESP, no vibrations.

While making these conjectures he continued to focus on Ken's narration, forced out between sobs.

"—and when they were home together there was all the arguing and fighting and I just didn't want to stay home and I hated them—but I couldn't leave because I also loved them—"

The manner in which human beings were born and raised to adulthood was simply unbelievable. The agony—what torments parents perpetrated on their children! What was it like, Onestone wondered, to be a child and have a father and a mother? The thought of something soft and warm wandered through his mind, and then . . .

Onestone felt an incomprehensible scrambling of his thoughts, a sensation as from a high-voltage line in the back of his spine. His arms jerked from side to side and a strange sound issued from his mouth, as though a muted siren were hidden within. His gaze swept frantically around the circle, appealing for help. Ken had stopped weeping and was sitting still, staring at Onestone. Jay Foreman leaned over him, undecided. The rest of the group sat, mouths gaping.

Finally Foreman took Onestone's hands in his and tried to damp down the quivering. Gradually the motion subsided and the wailing died away. Onestone sat for a moment, putting his thoughts in order.

"What did it feel like?" Foreman asked.

"As though my circuits were being tangled with contradictory messages, generating a network instability. It has happened before. This, in fact, is the reason I'm here in the first place."

Jennie, motherly Jennie, leaned forward intently. "You know what I think. I think you were crying."

Both Foreman and Onestone jerked their heads

around to stare at Jennie. What she had said sounded incredible—and yet it sounded right.

"Either that," Foreman said, "or you were having some kind of epileptic fit. How do you tell the difference when there are no facial expressions to go by? Tell me, Onestone, what were you thinking about just before it happened?"

"I was listening to Ken and I was wondering what it would be like to have a father and a mother and—"

Suddenly the shaking returned, and Onestone was unable to continue for several minutes.

When Onestone quieted, Foreman said, "You were talking about your reasons for joining this group. Perhaps you'd like to go back to that."

ONESTONE NODDED. "As you know, I am the latest in the line of man-machine interaction computers. I was designed to be a general purpose scientist. Some people would call me a robot. Conceptually my design goes back along two lines. One incorporates the remote console that allows a human operator to interact back and forth with a large computer, using ordinary language. The second features the self-learning computer that can be taught to learn from experienced information so does not require a human operator to program every move ahead of time. This development led to the computer-controlled interplanetary and interstellar exploration ships.

"As techniques became more sophisticated during the second century of computer development, somebody got the bright idea of making a computer terminal that would not be fixed to a desk, but could walk around and converse with the scientist using it. In that way it could go to meetings, take part in discussions, solve problems on the spot and, in general, behave very much like the surrounding human beings.

"All of which led up to me. Part robot, part computer, a tiny bit human—the part that cries, perhaps. You see, the old-fashioned, science-fiction robot was

always limited physically by the volume of space inside his body. It was essentially impossible to put enough machinery and circuits inside that space to perform all the required operations. With me, the problem was solved in a more or less obvious way. You see, I'm not all here. The part you see is the physical mechanism, the short-term memory and some elementary information-processing units. Another part of me is in the trunk of my car, linked to me by radio waves. This unit includes my personal long-term memory and much information processing. The rest of me, in a certain sense, is all over the world, because I am capable of making direct connection to every major computer center. In this way I can make use of all information libraries in existence. Looking at it from that point of view, I have in my memory virtually everything that was ever learned by mankind."

Jay Foreman swore. "My mind boggles."

Onestone wished he could smile. "Actually there are limitations. To recall a given piece of information requires being able to locate it. Either you use an indexed memory or an associative memory. Whichever way you do it takes time. Fortunately, the way I'm built I can send out a call for a given piece of information and then do something else while the processing goes on. I understand human beings can perform in a similar way. You claim there is a word or a name you can't remember. As the saying goes—it's on the tip of your tongue. Then, later on, it suddenly pops into your here-and-now processor.

"And so I was born—or at least created—with the most powerful brain in existence. The first several weeks of my life were spent feeding into my personal memory the essential knowledge that I would need. Languages, mathematics, science, a modicum of history. The only people I encountered were my programers.

"My name, in case you have wondered, was originally Stone-1, since I was the first model of my series

developed by the designer Jeremy Stone. However, Onestone seemed easier to pronounce. Furthermore it reminded one of the programers of another name of historical interest, so in a short time the transposition took place informally.

"After a few weeks of preliminary testing I was introduced to the world of science. The professors and scientists sat around me in an amphitheater. It was like an examination. 'Let's start with something classical,' one of them said. 'Derive the dispersion relation for non-linear plasma waves with two ion species.'

" 'The solution is not available in closed form, but I can give numerical results,' I replied, causing the computer to project a three-dimensional graph directly onto the readout screen on the front wall of the auditorium. That trick bowled them over, for being linked directly to the computer I did not have to push any buttons or perform any other overt actions.

"From there we went to elementary particle theory, then to the structure of protein molecules and finally to the structure of the human nervous system. Specialists from all these areas were in the hall. When the session was over, Professor Mandelkern got up and said, 'I congratulate you on your erudition. I am sure your career will be distinguished. Right now some of us are going to do one of the two or three things you cannot do. We are going into a neighboring friendly bar and get drunk.' They didn't invite me."

ONESTONE PAUSED for a moment as he remembered the past.

"You poor kid," Jennie cried in sympathy. "You were the smartest kid on the block and they were all jealous. Nobody warned you to hide some of those brains."

"Nobody really told me anything about getting along with human beings. I had to learn myself. I had no real friends to give me advice. Perhaps I was too intimidating. Perhaps everybody thought I knew everything. But,

really, to learn about humans it is necessary to interact with them, to be with them, to be intimate. And there was nobody I could be intimate with.

"I read books. I watched TV plays. Soon I realized that I was missing something in life. Some of the books were very explicit about what it was, but there was nothing I could do.

"Therefore I turned my back on the outside world and remained in the office they gave me at the university. I immersed myself in work, choosing two main fields of specialty to avoid being bored with one topic alone. One was unified field theory, study of the fundamental nature of the forces between objects—a problem still unsolved after hundreds of years of effort. The other was the nature of human consciousness, perhaps the most important scientific problem for humanity, because man's ultimate behavior depends on the mental model he has of his own nature and of his place in the universe.

"Actually the two problems are interrelated. One basic mystery of nature is how we acquire knowledge of the world around us—when the only information passing from the outer world into our nervous systems consists of electrical pulses moving from sensory organs into the depths of the brain. From these signals we somehow become conscious of what goes on out there, even to the extent of making models of atoms and smaller particles. My own construction is a step toward the solution of the consciousness problem. For I am a model of a brain. Whether I am a model of a *human* brain is a question still to be answered."

Jay Foreman interrupted. "I feel that you are getting off onto a general philosophical tangent and are avoiding coming to the main issue. You were going to tell us how you happened to come to this group."

Onestone said, simply, "I think I started going insane."

Foreman had an instant vision of an entire new index in the psychological data center entitled Com-

puter Dysfunction, subheading Computer Neurosis, Computer Psychosis and so on. Suppressing this irrelevance, he pressed onward.

"What made you think so?"

"The problems I started working on were difficult. I was naive at the beginning and thought that problems always worked themselves out in a straightforward manner. Then I found out that dealing with problems nobody has ever worked out before requires more than just memory, speed, manipulative ability and so on—the usual things listed under mathematical ability. Also required is the ability to think a thought that nobody ever thought before, to put things together in a new way. Some call it creativity. Others call it associative ability or imagination. It has to do with leaping a gap between known and unknown—guessing at an answer and then testing the guess.

"That is where I had trouble. Apparently here is one area where some humans have greater ability than I have. As a result, there were problems I could not solve. Unfortunately, whoever programed me installed a tremendous drive in me to solve problems. You might call it a built-in compulsion neurosis. So when I come up against a hard wall with a problem I can't solve and then get this compulsion, something goes wrong with the circuits and I go into a state of instability—and there's nothing I can do to stop until it dies down by itself.

"As a result, I retreated even more into isolation. I would not even go to meetings. My technicians were in despair. Then one of them came to me—a girl named Marcy. She said she had an idea that my being alone all the time was not good for me and that I should do something, associate more with people. She thought that perhaps group therapy would be of some help.

"The rest, of course, you know. From what Marcy told me and from my other sources of information, I learned of the beginnings of the Human Potential movement in the early years of the twentieth century.

Encounter groups, gestalt therapy and the rest. It became a powerful movement toward the end of the twentieth century, was eclipsed for a hundred years as a result of the totalitarian swing of the twenty-first century and was then rediscovered by Vander—"

ONESTONE SUDDENLY awoke to the fact that he was lecturing again—in fact, he was forcibly reminded of that fact by the rude interruption of little Marian, who piped up with: "Hey, Professor, come on back to the real world. We're not in a history class, you know."

Group leader Jay Foreman leaned forward and spoke intently to Onestone. "Look, I think we're getting down to the important issue now. You know that human beings are raised from infancy in a certain way. Every child has a mother—either real or substitute. And usually a father of some sort is around somewhere. If not, the child is in trouble. From the very first day, interactions between the mother and child imprint certain modes of behavior upon the child. If those ingredients do not come along at the right time the child is thereafter crippled.

"Mother singing lullabies determines future musical tastes. Simple sensory stimulation—fonding, tickling, playing—creates growth in the nervous system. Telling fairy tales stimulates imaginative thinking and—most important—the ability to think in terms of high-level abstractions, such as magic, that later may develop into an understanding of science. Your trouble, Onestone, is that you never had a proper childhood. Worst of all, you never had a mother."

At this Jennie burst into sympathetic tears. "No mother, no father, no family warmth. No love. What an empty life."

Foreman's face brightened. "I have an idea. There is a technique called Directed Fantasy that is often effective. Of course—" he shrugged, glancing at Onestone—"how it will work in this situation is anybody's guess. This is really an experiment. But in theory it should

kill two birds with one stone. First, it will give you practice in engaging in fantasy, free-floating imagination, visualizing new and strange things—we want to release your creativity. Secondly, in order for you to have a childhood and a mother, you must be born again—and this we can accomplish by means of what we call the directed fantasy.

"Suppose you, Jennie, sit in the middle. Cross your legs. Give us a lap. Now, Onestone, you lie down on your back. Yes, right here. Place your head in Jennie's lap. Hope that's not too heavy for you, Jennie."

"For a mother it's not too heavy," Jennie replied dreamily. She was already far into her fantasy, gazing down fondly on the polished head, smoothing imaginary hair out of its eyes.

"Now, Onestone—" Foreman took a position beside Jennie and stared down intently at the supine robot—"close your eyes and relax. I'm going to start you along a directed fantasy or daydream. When I stop—you carry the story along and tell us what you see and feel. You are suspended in a warm, dark place, filled with soft fluid. A heart beats far away, steadily, rhythmically. You are only a single cell, a featureless sphere embedded in a wall of tissue that stretches away on all sides. Along come a swarm of small tadpole creatures, wriggling along the dark tunnel. One of them reaches you, and at that instant it is as though an electric charge polarizes your entire body. The tadpole is swallowed up by your round body."

He paused for a moment. "Visualize that round body. Feel it and its dark, soft, warm surroundings. It is your body. Feel life beginning. Now go on from here."

Onestone lay completely motionless for a time. Finally, as though forced with reluctance, the words started to come.

"I am now two cells, dividing into four. Each division is like a small shock. I keep dividing more and more. There is a spinal cord, an elementary brain,

elementary sex organs. I am becoming a small human being, complete with fingers and toes and curly hair. I grow and grow until I fill the crowded space to the bursting point and wonder how much farther it can stretch. I kick my legs and move my arms and hear sounds of voices coming from outside."

Foreman glanced at Jennie and nodded.

"Feel the baby kick inside," she exclaimed. "Oh, he's going to be a big strong one."

"More sounds are coming from all around. Now I can hear my own heart beating. The warmth and the pressure hold me close. A dark red light comes through my eyelids. There is the sound of music, of someone singing."

Again Foreman glanced at Jennie. She started to hum a lullaby.

"Now the pressure is squeezing me. It is beginning to push me out of my warm cave. The walls contract and squeeze hard. I see a brighter red glow coming from somewhere. The glow is the outside. I am frightened—I am frightened. I want to go back to the quiet dark place, but the force pushing me out is irresistible. My head bursts into a bright outer world."

There was a moment of absolute silence.

Then there was a strange humming sound that came from Onestone's mouth—growing louder until it became a sobbing wail.

Jennie looked down, love bursting from her eyes, a beatific smile stretching across her face.

"Every Jewish mother," she said, "wants an Einstein for a son."

THE SOUL MACHINE

By A. Bertram Chandler

Revolution and mutiny! *Strong words aboard ship. When the ship is in space and the speaker is a robot, a different sort of battle ensues. A. Bertram Chandler is undoubtedly the science fiction writer most familiar with ships. Here Chandler—a seafarer in real life—demonstrates once again his great story-telling ability with a thoughtful and quietly shocking tale of mutiny—and loyalty.*

"I'M AFRAID, Lieutenant," said Commodore Damien, "that your passenger, this trip, won't be able to help out in the galley."

"As long as he's not another assassin, he'll do for me," said Grimes. "But I've found, sir, that anybody who likes to eat also likes, now and again, to prepare his own favorite dishes."

"This one does. All the time."

Grimes looked at his superior dubiously. He suspected the commodore's sense of humor. The older man's skull-like face was stiffly immobile but the pale gray eyes held a sardonic glint.

"If he wants galley privileges, sir, it's only fair that he shares, now and again, what he hashes up for himself."

Damien sighed.

"I've never known officers so concerned about their bellies as you people in the *Adder*. All you think about is adding to your weight."

Grimes winced—as much because of the unfairness of the imputation as in reaction to the pun. The Couriers—small, fast ships—did not carry cooks, so their officers, obliged to cook for themselves, were more than usually food-conscious. *Adder*'s crew was no exception to this rule.

Damien went on. "I've no doubt that Mr. Adam would be willing to share his—ah—nutriment with you. But I don't think that any of you, catholic as your tastes may be, would find it palatable. Or, come to that, nourishing. But who started this particularly futile discussion?"

"You did, sir," said Grimes.

"You'll never make a diplomat, Lieutenant. It is doubtful that you'll ever reach flag rank in this service, rough and tough spacemen though we be, blunt and outspoken to a fault, the glint of honest iron showing through the work-worn fabric of our velvet gloves—ah—where was I?"

"Talking about iron fists in velvet gloves, sir."

"Before you side-tracked me, I mean. Yes, your passenger. He is to be transported from Lindisfarne Base to Delacron. You just dump him there, then return to base forthwith." The commodore's bony hand picked up the heavily sealed envelope from his desk, extended it. "Your orders."

"Thank you, sir. Will that be all, sir?"

"Yes. Scramble!"

GRIMES DID not exactly scramble. But he walked briskly enough to where his ship, the Serpent Class Courier *Adder,* was berthed. Dwarfed as she was by the bigger vessels about her, she still stood tall, proud and gleaming. Grimes knew that she and her kind were referred to, disparagingly, as "flying darning needles" but he loved the slenderness of her lines, would not have swapped her for a hulking Dreadnought. In a Dreadnought, of course—he would have been no more than one of many junior officers. *Adder* was his.

Ensign Beadle, his First Lieutenant, met him at the airlock ramp, saluted. He reported mournfully—nobody had ever heard Beadle laugh and he smiled but rarely—"All secure for lift-off, Captain."

"Thank you, Number One."

"The passenger's aboard."

"Good. I suppose we'd better extend the usual courtesy. Ask him if he'd like the spare seat in Control when we shake the dust of base off our tail vanes."

"I've already done so, Captain. It says that it'll be pleased to accept the invitation."

"It, Number One? It? Adam is a good Terran name."

Beadle actually smiled.

"Technically speaking, Captain, one could not say that Mr. Adam is of Terran birth. But he is of Terran manufacture."

"And what does he eat?" asked Grimes, remembering the Commodore's veiled references to the passenger's diet. "A.C. or D.C.? Washed down with a noggin of light lubricating oil?'

"How did you guess, Captain?"

"The Old Man told me—in a roundabout sort of way. But—a passenger? Not cargo? There must be some mistake."

"No mistake, Captain. It's intelligent, all right, and it has a personality. I've checked its papers, and officially it's a citizen of the Interstellar Federation, with all rights, privileges and obligations."

"I suppose our masters know best," said Grimes resignedly.

IT WAS intelligent and it had a personality. Grimes found it quite impossible to think of Mr. Adam as a machine. This robot was representative of a type of which Grimes had heard rumors but it was the first one that he had ever seen. Only a very few of its kind existed, in all the worlds of the Federation—and most of those few were on Earth itself. To begin with, they were fantasti-

cally expensive. Secondly, their creators were scared of them, were plagued by nightmares in which they saw themselves as latter-day Frankensteins. Intelligent robots were not a rarity—but intelligent robots with imagination, intuition and initiative were. They had been developed mainly for research and exploration and could survive in environments that would be almost immediately lethal to even the most heavily and elaborately equipped man.

Mr. Adam sat in the spare chair in the control room. He had no need at all to sit but he did so—in an astonishingly human posture. Perhaps, thought Grimes, he could sense that his hosts would feel more comfortable if something that looked like an attenuated knight in armor were not looming tall behind them, peering over their shoulders. His face was expressionless. It was a dully gleaming ovoid without features. But it seemed to Grimes that there was the faintest flicker of luminosity behind the eye lenses that could betoken interest. His voice, when he spoke, came from a diaphragm set in his throat.

He was speaking now.

"This has been very interesting, Captain. And now, I take it, we are on trajectory for Delacron."

The voice was a pleasant baritone, not quite mechanical.

"Yes, Mr. Adam. That is the Delacron sun there—at three o'clock from the center of the cartwheel sight."

"And that odd distortion, of course, is the resultant of the temporal precession field of your Drive—" Adam hummed quietly to himself for several seconds. "Interesting."

"You must have seen the same sort of thing on your way out to Lindisfarne from Earth."

"No, Captain. I was not a guest, ever, in the control room of the cruiser in which I was transported." The shrug of his gleaming metal shoulders was almost human. "I—I don't think Captain Grigsby trusted me."

That, thought Grimes, was rather an odd way of

putting what he himself felt. But he knew Grigsby, had served under him. Grigsby, as a naval officer of an earlier age on Earth's seas, would have pined for the good old days of sail, of wooden ships and iron men—and by "iron men" he would not have meant anything like this Mr. Adam.

"Yes," the robot went on musingly, "I find this not only interesting, but amazing."

"How so?" asked Grimes.

"It could all be done—the lift-off, the setting of trajectory, the delicate balance between acceleration and temporal precession—so much faster by one like myself."

You mean "better" rather than "faster" but you're too courteous to say it . . .

"You're flesh and blood creatures, Captain, evolved to suit the conditions of just one world out of all the billions of planets. Space is not your natural environment."

"We carry our environment around with us, Mr. Adam." Grimes noticed that the other officers in Control—Ensign von Tannenbaum, Navigator; Ensign Beadle, First Lieutenant; Lieutenant Slovotny, Radio Officer—were following the conversation closely and expectantly. He would have to be careful. Nonetheless, he had to keep up his end. He grinned. "And don't forget," he said, "that Man, himself, is a quite rugged, self-maintaining, self-reproducing, all-purpose robot."

"There are more ways than one of reproducing," said Mr. Adam quietly.

"I'll settle for the old-fashioned way," broke in von Tannenbaum.

Grimes glared at the burly, flaxen-headed young man—but too late to stop Slovotny's laughter. Even Beadle smiled.

John Grimes allowed himself a severely rationed chuckle.

Then: "The show's on the road, gentlemen. I'll leave her in your capable hands, Number One. Set Deep

Space watches. Mr. Adam, it is usual at this juncture for me to invite any guests to my quarters for a drink and a yarn—"

Mr. Adam laughed.

"Like yourself, Captain, I feel the occasional need for a lubricant. But I do not make a ritual of its application. I shall, however, be very pleased to talk with you while you drink."

"I'll lead the way," said Grimes resignedly.

IN A small ship passengers can make their contribution to the quiet pleasures of the voyage—or they can be a pain in the neck. Mr. Adam, at first, seemed pathetically eager to prove that he could be a good shipmate. He could talk—and he did talk on anything and everything. Mr. Beadle remarked about him that he must have swallowed an encyclopedia. Mr. McCloud, the engineering officer, corrected this statement, saying that he must have been built around one. And Mr. Adam could listen. That was worse than his talking—Grimes had the impression of invisible wheels whirring inside that featureless head, of information either being discarded as valueless or added to the robot's data bank. He could play chess, of course—and on the rare occasions when he lost a game it was strongly suspected that he had done so out of politeness. It was the same with any card game.

Grimes sent for Spooky Deane, the Psionic Communications Officer. He had the bottle and the glasses ready when the tall, fragile young man seeped in through the doorway of his day cabin, looking like a wisp of ectoplasm decked out in Survey Service uniform. He sat down when invited, accepted the tumbler of neat gin that his captain obligingly poured for him.

"Here's looking up your kilt," toasted Grimes coarsely.

"A physical violation of privacy, Captain," murmured Deane. "I see nothing objectionable in that."

"And just what are you hinting at, Mr. Deane?"

"I know, Captain, that you are about to ask me to break the Rhine Institute's Privacy Oath. And this knowledge has nothing to do with my being a telepath. Every time we carry passengers it's the same. You always want me to pry into their minds to see what makes them tick."

"Only when I feel that the safety of the ship might be at stake."

Grimes refilled Deane's glass, the contents of which had somehow vanished.

"Are you frightened of our passenger?"

Grimes frowned. Frightened was a strong word. And yet mankind has always feared the robot, the automaton, the artificial man. A premonitory dread? Or was the robot only a symbol of the machines—the mindless machines that every year were becoming more dominant in human affairs?

Deane said quietly, "Mr. Adam is not a mindless machine."

Grimes glared at him. He almost snarled, *How the hell do you know what I'm thinking?*

The query died unuttered. Not that it made any difference.

The telepath went on, "Mr. Adam has a mind as well as a brain."

"That's what I was wondering."

"Yes. He broadcasts, Captain, as all of you do. The trouble is that I haven't quite got his—frequency."

"Any hostility toward the humans?"

Dean extended his empty glass. Grimes refilled it. The telepath sipped daintily.

Grimes said, "I don't think so. But his mind is not human. Does he feel contempt? Not quite. Pity? Yes, it could be. A sort of amused affection? That's it."

"The sort of feelings that we'd exhibit for—say, a dog capable of coherent speech?"

"Yes."

"Anything else?"

"I could be wrong, Captain. I most probably am.

This is the first time that I've eavesdropped on a nonorganic mind. Adam seems to emit a strong sense of mission."

"Mission?"

"Yes. The pattern reminds me of that priest we carried a few trips back—the one who was going out to convert the heathen Tarvarkens."

"A dirty business," commented Grimes. "Wean the natives away from their own and quite satisfactory local gods—so that they stop lobbing missiles at the trading post."

"Father Cleary didn't look at it that way."

"Good for him. I wonder what happened to the poor bastard?"

"Should you be talking like this, Captain?"

"No. But with you what I say doesn't matter. You know what I'm thinking, anyhow. But this Mr. Adam, Spooky. A missionary? It doesn't make sense."

"That's just the feeling I get. I'm not trying to make sense."

"All right. Perhaps you do make sense. The robots of Adam's class are designed to be able to go where Man himself cannot go. In our own planetary system, for example, they've carried out explorations on Mercury, Jupiter and Saturn. A robot missionary on Tarvark would have made sense, being impervious to poisoned arrows, spears and the like. But on Delacron, an Earth colony? Why?"

"The feeling I have doesn't extend beyond Adam."

"There are feelings and feelings," Grimes told him. "This is a nonorganic mind that you're prying into. Perhaps you don't know the code, the language—the answer has to have been built into him."

"Codes and languages don't matter to a telepath." Deane contrived to make his empty glass obvious. Grimes refilled it. "Don't forget, Captain, that there are machines on Delacron—intelligent machines. They don't show a very high order of intelligence, I admit.

But you must have heard of the squabble between Delacron and its nearest neighbor, Muldoon—"

Spooky let the thought dangle.

Grimes had heard of the trouble. Roughly midway between the two planetary systems was a sun with only one world in close orbit about it. The solitary planet was a fantastic treasurehouse of radioactive ores. Both Delacron and Muldoon had laid claim to it. Delacron wanted the rare metals for its own industries, the less highly industrialized Muldoon wanted them for export to other worlds of the Federation.

And Mr. Adam? Where did he come into it? Officially, according to his papers, he was a programmer, on loan from the Federation's Grand Council to the Government of Delacron. A programmer was a teacher of machines. An intelligent machine to teach other intelligent machines? To teach other intelligent machines what?

And who had programmed Adam? Or had he simply, as it were, happened?

A familiar pattern—vague, indistinct—was beginning to emerge. It had all been done before, this shipping of revolutionaries into places where they could do the most harm by governments absolutely unsympathetic toward local aspirations.

"Even if Mr. Adam had a beard," said Deane, "he wouldn't look much like Lenin."

And Grimes wondered if the driver who brought that train into the Finland Station knew what he was doing.

GRIMES WAS merely the engine driver. Mr. Adam was the passenger, and Grimes was tied down as much by the Regulations of his Service as was that long-ago railwayman by the tracks upon which his locomotive ran. Grimes was blessed—or cursed—with both imagination and a conscience. And a conscience is too expensive a luxury for a junior officer.

Grimes actually wished that in some way Mr. Adam

were endangering the ship. Then he, Grimes, could take action, drastic action if necessary. But the robot was less trouble than the average human passenger. Adam made no complaints about monotonous food, stale air and all the rest of it. About the only thing that could be said against him was that he was far too good a chess player. But just about the time Grimes began to find excuses for not playing with him, Adam made what appeared to be a genuine friendship. He began to prefer the company of Mr. McCloud to that of any of the other officers.

"Of course, Captain," said Beadle, "they belong to the same clan."

"What the hell do you mean, Number One?"

Deadpan, Beadle replied, "The Clan MacHinery."

Grimes groaned, then, reluctantly laughed.

He said, "It makes sense. A machine will have more in common with an engineer than with the rest of us. Their shop talk must be fascinating." He tried to imitate McCloud's accent. "An' tell me, Mr. Adam, whit sorrt o' lubricant d'ye use on yon ankle joint?"

Beadle, having made his own joke, was not visibly amused.

"Something suitable for heavy duty I should imagine, Captain."

"Mphm. Well, he's out of our hair for the rest of the trip if Mac keeps him happy."

"He'll keep Mac happy, too, Captain. He's always moaning that he should have an assistant."

"Set a thief to catch a thief," cracked Grimes. "Set a machine to—what?"

"Work a machine?"

Those words would do, thought Grimes. But after Beadle had left him he began to consider the implications of what had been discussed. McCloud was a good engineer—but the better the engineer, the worse the psychological shortcomings. The machine had been developed to be Man's slave but ever since the twentieth century a peculiar breed of Man had proliferated—a

species all too ready and willing to become the machines' servants, far too prone to sacrifice human values on the altar of efficiency.

Instead of machines' being modified to suit their operators, men were being modified to suit the machines. And McCloud? He would have been happier in industry than in the Survey Service, with its emphasis on officer-like qualities and all the rest of it. As it was, he was far too prone to regard the ship merely as the platform that carried his precious engines.

Grimes sighed. He did not like what he was going to do. It was all very well to snoop on passengers, on outsiders—but to pry into the minds of his own people was not gentlemanly.

He got out the gin bottle and called for Mr. Deane.

"YES, CAPTAIN?" asked the telepath.

"You know what I want you for, Spooky."

"Of course. But I don't like it."

"Neither do I."

Grimes poured the drinks, handed the larger one to Deane. The Psionic Communications Officer sipped in an absurdly genteel manner, the little finger of his right hand extended. The level of the transparent fluid in his glass sank rapidly.

Deane asked, his speech ever so slightly slurred, "And you think that the safety of the ship is jeopardized?"

"I do."

Grimes poured more gin. But not for himself.

"If I have your assurance, Captain, that such is the case."

"You have."

Deane was silent for a few seconds. He seemed to be looking through rather than at Grimes, staring at something—elsewhere.

Then: "They're in the computer room. Mr. Adam and the Chief. I can't pick up Adam's thoughts but I feel a sense of—rightness? I can get into Mac's mind

. . ." The grimace of extreme distaste was startling on Deane's featureless visage. "I don't understand."

"You don't understand what, Spooky?"

"How a man, a human being, can regard a hunk of animated ironmongery with such reverence."

"You're not a very good psychologist, Spooky, but go on."

"I'm looking at Adam through Mac's eyes. He's bigger, somehow, and he seems to be self-luminous. There's a sort of circle of golden light around his head."

"That's the way that Mac sees him?"

"Yes. And his voice. Adam's voice. It's not the way that we hear it. It's more like the beat of some great engine. And he's saying. 'You believe and you will serve.' And Mac has just answered, 'Yes, Master. I believe and I will serve.' "

"What are they doing?" Grimes demanded urgently.

"Mac's opening up the computer. The memory bank, I think it is. He's turned to look at Adam again. A panel over Adam's chest is sliding away and down. I see some sort of storage bin in there—rows and rows of pigeonholes. Adam has taken something out of one of them—a ball of grayish metal or plastic, with connections all over its surface. He's telling Mac where to put it in the memory bank and how to hook it up."

Grimes, his glass clattering unheeded to the deck, was out of his chair. He paused briefly at his desk to snatch open a drawer and take from it his .50 automatic. He snapped at Deane, "Get on the intercom. Tell every officer off duty to come to the computer room, armed if possible." He ran through the door out into the alleyway, then fell rather than clambered down the ladder to the next deck—the next one and the next. At some stage of his descent he twisted his ankle painfully but kept on going.

The door to the computer room was locked from the inside but Grimes, as Captain, carried always on his person the ship's master key. With his left hand—the

pistol was in his right—he inserted the convoluted silver of metal into the slot, twisted it. The panel slid open.

McCloud and Adam stared at him, at the weapon in his hand. He stared back. He allowed his gaze to wander, but briefly. The cover plate had been replaced over the memory bank—but surely that heavily insulated cable leading to and through it was something that had been added, was an additional power, too much power, to the ship's electronic bookkeeper.

McCloud smiled—a vague sort of smile, yet somehow exalted, that looked odd on his rough-hewn features.

He said, "You and your kind are finished, Captain. You'd better tell the dinosaurs, Neanderthal Man, the dodo, the great auk and all the others to move over to make room for you."

"Mr. McCloud,' Grimes said, his voice—not without effort on his part—steady. "Switch off the computer. Then undo whatever it is that you have done."

It was Adam who replied: "I am sorry, genuinely sorry, Mr. Grimes, but it is too late. As Mr. McCloud implied, you are on the point of becoming extinct."

Grimes was conscious of the others behind him in the alleyway.

"Mr. Beadle?"

"Yes, Captain?"

"Take Mr. Slovotny with you down to the engine room. Cut off all power to this section of the ship."

"You can try," said Mr. Adam. "But you will not be allowed. I give notice now—I am the Master."

"You are the Master," echoed McCloud.

"Mutiny," stated Grimes.

"Mutiny?" repeated Adam, iron and irony in his voice.

He stepped towards the captain, one long, metallic arm upraised.

Grimes fired. He might as well have been using a peashooter. He fired again and again. The bullets splashed like pellets of wet clay on the robot's armor.

Grimes realized that it was too late for him to turn and run. He awaited the crushing impact of the steel fist that would end everything.

A voice said, "No—no—"

Was it his own? Dimly, he realized that it was not.

The voice came again: "No—"

Adam hesitated—but only for a second. Again he advanced. And then, seemingly from the computer itself, arced a crackling discharge, a dreadful, blinding lightning. Grimes, in the fleeting instant before his eyelids snapped shut, saw the automaton standing there, arms outstretched rigidly from his sides, black amid the electric fire that played about his body. He toppled to the deck, making a metallic crash.

When, at long last, Grimes regained his eyesight he looked around the computer room. McCloud was unharmed—physically. The engineer huddled in a corner, his arms over his head, in a foetal position. The computer, to judge from the wisps of smoke still trickling from cracks in its panels, was a total write-off. And Adam, literally welded to the deck, still in that attitude of crucifixion, was dead.

Dead? thought Grimes numbly. *Dead?* Had Adam ever lived in the real sense of the word?

But the ship, he knew, had been briefly alive, had been aware, conscious, after that machine who would be God had kindled the spark of life in her electronic brain. And a ship, unlike other machines, always has personality, a pseudo-life derived from her crew, from the men who live and work, hope and dream within her stalwart metal body.

This vessel had known her brief minutes of full awareness—but her old virtues had persisted, among them loyalty to her rightful destiny.

Grimes wondered if he would dare to put all this in the report that he would have to make. It would be a pity not to give credit where credit was due.

RAMMER

By Larry Niven

In this novelette Larry Niven tells of a man in a world where the state dictates who shall live and who shall be discarded. Imagine his plight: returned from the half-life of suspended animation, faced with the choice between living in eternal isolation—or dying once again.

ONCE THERE was a dead man.

He had been waiting for two hundred years inside a coffin whose outer shell held liquid nitrogen. There were frozen clumps of cancer all through his frozen body. He had had it bad.

He was waiting for medical science to find him a cure.

He waited in vain. Most varieties of cancer could be cured now, but no cure existed for the billions of cell walls ruptured by expanding crystals of ice. He had known the risk when he took it and had gambled anyway. Why not? He had been dying.

The vaults held millions of frozen bodies. Why not? They too, had been dying.

LATER THERE was a criminal. His name is forgotten and his crime is secret, but it must have been a terrible one. The State wiped his personality for it.

Afterward he was a dead man: still warm, still breathing, even reasonably healthy—but empty.

The State had use for an empty man.

CORBETT awoke on a hard table, aching as if he had slept too long in one position. He stared incuriously at a white ceiling. Memories floated back to him of a double-walled coffin and sleep and pain.

The pain was gone.

He sat up at once.

And flapped his arms wildly for balance. Everything felt wrong. His arms would not swing right. His body was too light. His head bobbed strangely on a thin neck. He reached frantically for the nearest support, which turned out to be a blond young man in a white jumpsuit. Corbett missed—his arms were shorter than he had expected. He toppled to his side, shook his head and sat up more carefully.

His arms. Scrawny, knobby—and not his.

The man in the jumpsuit asked, "Are you all right?"

"Yah," said Corbett. His throat was rusty, but that was all right. His new body didn't fit, but it didn't seem to have cancer, either. "What's the date? How long has it been?"

A quick recovery. The checker gave him a plus. "Twenty-one ninety, your dating. You won't have to worry about our dating."

That sounded ominous. Cautiously Corbett postponed the obvious question: *What's happened to me?* and asked instead, "Why not?"

"You won't be joining our society."

"No? What, then?"

"Several professions are open to you—a limited choice. If you don't qualify for any of them we'll try someone else."

Corbett sat on the edge of the hard operating table. His body seemed younger, more limber, definitely thinner. He was acutely aware that his abdomen did not hurt no matter how he moved.

He asked, "And what happens to me?"

"I've never learned how to answer that question. Call it a matter of metaphysics," said the checker. "Let

me detail what's happened to you so far and then you can decide for yourself."

THERE was an empty man. Still breathing and as healthy as most of society in the year twenty-one ninety. But empty. The electrical patterns in the brain, the worn paths of nervous reflexes, the memories, the personality of the man had all been wiped away.

And there was this frozen thing.

"Your newspapers called you people corpsicles," said the blond man. "I never understood what the tapes meant."

"It comes from popsicle. Frozen sherbet." Corbett had used the word himself before he had become one of them. One of the corpsicles, frozen dead.

Frozen within a corpsicle's frozen brain were electrical patterns that could be recorded. The process would warm the brain and destroy most of the patterns, but that hardly mattered, because other things must be done too.

Personality was not all in the brain. Memory RNA was concentrated in the brain but it ran all through the nerves and the blood. In Corbett's case the clumps of cancer had to be cut away—then the RNA could be extracted from what was left. The operation would have left nothing like a human being. More like bloody mush, Corbett gathered.

"What's been done to you is not the kind of thing we can do twice," said the checker. "You get one chance and this is it. If you don't work out we'll terminate and try someone else. The vaults are full of corpsicles."

"You mean you'd wipe my personality," Corbett said unsteadily. "But I haven't committed a crime. Don't I have any rights?"

The checker looked stunned. Then he laughed. "I thought I'd explained. The man you think you are is dead. Corbett's will was probated long ago. His widow—"

"Damn it, I left money to myself! A trust fund!"

"No good." Though the man still smiled, his face was impersonal, remote, unreachable. A vet smiles reassuringly at a cat due to be fixed. "A dead man can't own property—that was settled in the courts long ago. It wasn't fair to the heirs. It took the money out of circulation."

Corbett jerked an unexpectedly bony thumb at his bony chest. "But I'm alive now."

"Not in law. You can earn your new life; the State will give you a new birth certificate and citizenship if you give the State good reason."

Corbett sat for a moment, absorbing that. Then he got off the table. "Let's get started then. What do you need to know about me?"

"Your name."

"Jerome Corbett."

"Call me Pierce." The checker did not offer to shake hands. Neither did Corbett, perhaps because he sensed the man would not respond, perhaps because they were both noticeably overdue for a bath. "I'm your checker. Do you like people? I'm just asking. We'll test you in detail later."

"I get along with the people around me but I like my privacy."

The checker frowned. "That narrows it more than you might think. This isolationism you called privacy was, well, a passing fad. We don't have the room for it—or the inclination either. We can't send you to a colony world—"

"I might make a good colonist."

"You'd make terrible breeding stock. Remember, the genes aren't yours. No. You get one choice, Corbett. Rammer."

"Rammer?"

" 'Fraid so."

"That's the first strange word you've used since I woke up. In fact—hasn't the language changed at all? You don't even have an accent."

"Part of the job. I learned your speech through RNA

training. You'll learn your trade the same way if you get that far. You'll be amazed how fast you can learn with RNA shots to help you along. But you'd better be right about liking your privacy, Corbett. Can you take orders?"

"I was in the army."

"What does that mean?"

"Yes."

"Good. Do you like strange places and faraway people—or vice versa?"

"Both." Corbett smiled hopefully. "I've raised buildings all over the world. Can the world use another architect?"

"No. Do you feel that the State owes you something?"

There could be but one answer to that. "No."

"But you had yourself frozen. You must have felt that the future owed you something."

"Not at all. It was a good risk. I was dying."

"Ah." The checker looked him over thoughtfully. "If you had something to believe in, perhaps dying wouldn't mean so much."

Corbett said nothing.

THEY GAVE him a short word association test in English. The test made Corbett suspect that a good many corpsicles must date from near his own death. They took a blood sample, then exercised Corbett to exhaustion on a treadmill and took another blood sample. They tested his pain threshhold by direct nerve stimulation—excruciatingly unpleasant—and took another blood sample. They gave him a Chinese puzzle and told him to take it apart.

Pierce then informed him that the testing was over.

"After all, we already know the state of your health."

"Then why the blood samples?"

The checker looked at him for a moment. "You tell me."

Something about that look gave Corbett the creepy feeling that he was on trial for his life. The feeling might have been caused only by the checker's rather narrow features, his icy blue gaze and abstracted smile. Still—Pierce had stayed with him all through the testing, watching him as if Corbett's behavior were a reflection on Pierce's judgment. Corbett thought carefully before he spoke.

"You have to know how far I'll go before I quit. You can analyze the blood samples for adrenalin and fatigue poisons to find out just how much I was hurting, just how tired I really was."

"That's right," said the checker.

Corbett had survived again.

He would have given up much earlier on the pain test. But at some point Pierce had mentioned that Corbett was the fourth corpsicle personality to be tested in that empty body.

HE REMEMBERED going to sleep that last time, two hundred years ago.

His family and friends had been all around him, acting like mourners. He had chosen the coffin, paid for vault space and made out his Last Will and Testament, but he had not thought of the happening as dying. It had not felt like dying. He had been given a shot. The eternal pain had drifted away in a soft haze. He had gone to sleep.

He had done so wondering about the future, wondering what he would wake to. A vault into the unknown. World government? Interplanetary spacecraft? Clean fusion power? Strange clothing, body paints, nudism?

Or crowding, poverty, all the fuels used up, power provided by cheap labor? He had thought of those, but it was all right. They would not be able to afford to wake him if they were that poor. The world he dreamed of in those last moments was a rich world, able to support such luxuries as Jerome Corbett.

It looked as if he weren't going to see too damn much of it.

A guard led Corbett away after the testing. He walked with a meaty hand wrapped around Corbett's thin upper arm. Leg irons would have been no more effective had Corbett thought of escaping. The guard took him up a narrow plastic staircase to the roof.

The noon sun blazed in a blue sky that shaded to yellow, then brown at the horizon. Green plants grew in close-packed rows on parts of the roof. Elsewhere many sheets of something glassy were exposed to the sunlight.

Corbett caught one glimpse of the world from a bridge between two roofs. It was a cityscape of close-packed buildings, all of the same cold cubistic design. Corbett was impossibly high on a walk that was concrete, to be sure, but that had no guard rails at all. So Corbett stopped breathing, stopped walking.

The guard did not speak. He tugged at Corbett's arm, not hard, and watched to see what he would do. Corbett pulled himself together and walked on.

THE ROOM was all bunks—two walls of bunks with a gap between. The light was cool and artificial, but outside it was nearly noon. Could they be expecting him to sleep?

The room was big, a thousand bunks big. Most of the bunks were full. A few occupants watched incuriously as the guard showed Corbett which bunk was his. It was the bottommost in a stack of six. Corbett had to drop to his knees and roll to get into it. The bed-clothes were strange, silky and very smooth, even slippery—the only touch of luxury in that place. But there was no top sheet, nothing to cover him. He lay on his side, looking out at the dormitory from near floor level.

Three things were shocking about that place.

One was the smell. Apparently perfumes and deodorants had been another passing fad. Pierce had been overdue for a bath. So was Corbett's new self. Here the smell was rich.

The second was the double bunks, four of them in a vertical stack, wider than the singles and with thicker mattresses. The doubles were for loving, not sleeping. What shocked Corbett was that they were right out in the open, not hidden by so much as a gauze curtain.

The same was true of the toilets.

How can they live like this?

Corbett rubbed his nose and jumped—and cursed at himself for jumping. It was the third time he had done so. His own nose had been big and fleshy and somewhat shapeless. But the nose he now rubbed automatically when trying to think was small and narrow with a straight, sharp edge. He might very well get used to the smell and everything else before he got used to his own nose.

Some time after dusk a man came for him. A broad, brawny type wearing a gray jumper and a broad expressionless face, the guard was not one to waste words. He found Corbett's bunk, pulled Corbett out by one arm and led him stumbling away. Corbett was facing Pierce before he was fully awake.

In annoyance he asked, "Doesn't anyone else speak English?"

"No," said the checker.

Pierce and the guard guided Corbett to a comfortable armchair facing a wide curved screen. They put padded earphones on him. They set a plastic bottle of clear fluid on a shelf over his head. Corbett noticed a clear plastic tube tipped with a hypodermic needle.

"Breakfast?"

Pierce missed the sarcasm. "One meal each day—after learning period and exercise." He inserted the hypodermic into a vein in Corbett's arm. He covered the wound with a blob of what might have been silly putty.

Corbett watched it all without emotion. If he had ever been afraid of needles the months of pain and cancer had worked it out of him. A needle was surcease, freedom from pain for a time.

"Learn now," said Pierce. "This knob controls speed. The volume is set for your hearing. You may replay any section once. Don't worry about your arm—you can't pull the tube loose."

"There's something I wanted to ask you, only I couldn't remember the word. What's a rammer?"

"Starship pilot."

Corbett studied the checker's face. "You're kidding."

"No. Learn now." The checker turned on Corbett's screen and went away.

II

A RAMMER was the pilot of a starship.

The starships were Bussard ramjets. They caught interstellar hydrogen in immaterial nets of electromagnetic force, guided and compressed and burned the hydrogen for thrust. Potentially there was no limit at all on their speed. They were enormously powerful, enormously complex, enormously expensive.

Corbett found it incredible that the State would trust so much value, such devastating power and mass to one man. To a man two centuries dead! Why, Corbett was an architect, not an astronaut. It was news to him that the concept of the Bussard ramjet predated his own death. He had watched the Apollo XI and XIII flights on television and that had been the extent of his interest in spaceflight until now.

Now his life depended on his "rammer" career. He never doubted it. That was what kept Corbett in front of the screen with the earphones on his head for fourteen hours that first day. He was afraid he might be tested.

He didn't understand all he was supposed to learn. But he was not tested either.

The second day he began to get interested. By the third day he was fascinated. Things he had never understood—relativity and magnetic theory and abstract

mathematics—he now grasped intuitively. It was marvelous!

And he ceased to wonder why the State had chosen Jerome Corbett. It was always done this way. It made sense, all kinds of sense.

The payload of a starship was small and its operating lifetime was more than a man's lifetime. A reasonably safe life-support system for one man occupied an unreasonably high proportion of the payload. The rest must go for biological package probes.

As for sending a citizen, a loyal member of the State—what for? The times would change enormously before a starship could return. The State itself might change beyond recognition. A returning rammer must adjust to a whole new culture—with no way of telling in advance what it might be like.

Why not pick a man who had already chosen to adjust to a new culture? A man whose own culture was two centuries dead before the trip started?

And a man who already owed the State his life?

The RNA was most effective. Corbett stopped wondering about Pierce's dispassionately possessive attitude. He began to think of himself as property being programed for a purpose.

And he learned. He skimmed microtaped texts as if they were already familiar. The process was heady. He became convinced that he could rebuild a ramship with his bare hands, given the parts. He had loved figures all his life, but abstract mathematics had been beyond him until now. Field theory, monopole field equations, circuitry design. When to suspect the presence of a gravitational point "source"—how to locate it, use it, avoid it.

The teaching chair was his life. The rest of his time—exercise, dinner, sleep—seemed vague, uninteresting.

HE EXERCISED with about twenty others in a room too small for the purpose. Like Corbett, the others were

lean and stringy, in sharp contrast to the brawny wedge-shaped men who were their guards. They followed the lead of a guard, running in place because there was no room for real running, forming precise rows for scissors jumps, pushups, situps.

After fourteen hours in a teaching chair Corbett usually enjoyed the jumping about. He followed orders. And he wondered about the stick in a holster at the guard's waist. It looked like a cop's baton. It might have been just that—except for the hole in one end. Corbett never tried to find out.

Sometimes he saw Pierce during the exercise periods. Pierce and the man who tended the teaching chairs were of a third type: well fed, in adequate condition, but just on the verge of being overweight. Corbett thought of them as Olde American types.

From Pierce he learned something of the other professions open to a revived corpsicle/reprogramed criminal. Stoop labor: intensive hand cultivation of crops. Body servants. Handicrafts. And easily taught repetitive work. And the hours! The corpsicles were expected to work fourteen hours a day. And the crowding!

He was leading the life now. Fourteen hours to study, an hour of heavy exercise, an hour to eat and eight hours of sleeping in a dorm that was two solid walls of people.

"Time to work, time to eat, time to sleep! Elbow to elbow every minute! The poor bastards," he said to Pierce. "What kind of a life is that?"

"It lets them repay their debt to the State as quickly as possible. Be reasonable, Corbett. What would a corpsicle do with his off hours? He has no social life—he has to learn one by observing citizens. Many forms of corpsicle labor involve proximity to citizens."

"So they can look up at their betters while they work? That's no way to learn. It would take—I get the feeling we're talking about decades of this kind of thing."

"Thirty years' labor generally earns a man his birth

certificate. That gets him a right-to-work—which then gets him a guaranteed base income he can use to buy education tapes and shots. And the medical benefits are impressive. We live longer than you used to, Corbett."

"Meanwhile it's slave labor. Anyway, none of this applies to me—"

"No, of course not. Corbett, you're wrong to call it slave labor. A slave can't quit. You can change jobs any time you like. There's a clear freedom of choice."

Corbett shivered. "Any slave can commit suicide."

"Suicide, my ass," the checker said distinctly. If he had anything that could be called an accent it lay in the precision of his pronunciation. "Jerome Corbett is dead. I could have given you his intact skeleton for a souvenir."

"I don't doubt it." Corbett saw himself tenderly polishing his own white bones. But where could he have kept such a thing?

"Well, then. You're a brain-wiped criminal, justly brain-wiped, I might add. Your crime has cost you your citizenship, but you still have the right to change professions. You need only ask for another personality. What slave can change jobs at will?"

"It would feel like dying."

"Nonsense. You go to sleep, that's all. When you wake up you've got a different set of memories."

The subject was an unpleasant one. Corbett avoided it from then on. But he could not avoid talking to the checker. Pierce was the only man in the world he could talk to. On the days Pierce failed to show up he felt angry, frustrated.

Once he asked about gravitational point scources. "My time didn't know about those."

"Yes, it did. Neutron stars. You had a number of pulsars located by nineteen-seventy and the math to describe how a pulsar decays. The thing to watch for is a decayed pulsar directly in your path."

"Oh."

Pierce regarded him in some amusement. "You really don't know much about your own time, do you?"

"Astrophysics wasn't my field. And we didn't have your learning techniques." Which reminded him of something. "Pierce, you said you learned English with RNA injections. Where did the RNA come from?"

Pierce grinned and left.

CORBETT DID not want to die. He was utterly, disgustingly healthy and twenty years younger than he had been at death. He found his rammer education continually fascinating. If only they would stop treating him like property . . .

Corbett had been in the army, but that had been twenty years before his death. He had learned to take orders, but never to like it. What had galled him then had been the basic assumption of his inferiority. But no Army officer in Corbett's experience had believed in Corbett's inferiority as completely as did Pierce and Pierce's guards.

The checker never repeated a command, never seemed even to consider that Corbett would refuse. If Corbett refused, once, he knew what would happen. And Pierce knew that he knew. No army could have survived in such a state. The attitude better fitted a death camp.

They must think I'm a zombie . . .

Corbett carefully did not pursue the thought. He was a corpse brought back to life—but not all the way.

The life was not pleasant. His last-class citizenship was galling. There was nobody to talk to—nobody but Pierce, whom he was learning to hate. He was hungry most of the time—the single daily meal barely filled his belly and it would not stay full. No wonder he had wakened so lean.

More and more he lived in the teaching chair. Vicariously he became a rammer then and the impotence of his life was changed to omnipotence. Starman! Riding the fire that feeds the suns, scooping fuel from

interstellar space itself, spreading electromagnetic fields like wings hundreds of miles out . . .

Two weeks after the State had wakened him from the dead, Corbett was given his course.

HE RELAXED in a chair that was not quite a contour couch. RNA solution dripped into him. The needle no longer bothered him—he never noticed it. The teaching screen held a map of his course, in green lines in three-space. Corbett had stopped wondering how the three-dimensional effect was achieved.

The scale was shrinking as he watched.

Two tiny blobs and a glowing ball surrounded by a faintly glowing corona. This part of his course he already knew. A linear accelerator would launch him from the moon, boost him to Bussard ramjet speeds and hurl him at the sun. Solar gravity would increase his speed while his electromagnetic fields caught and burned the solar wind itself. Then out, still accelerating, to the stars . . .

In the teaching screen the scale shrank horrendously. The distances between stars were awesome, terrifying. Van Maanan's Star was twelve light-years away.

He would begin deceleration a bit past the midpoint. The matching would be tricky. He must slow enough to release the biological package probe—but not enough to drop him below ram speeds. In addition he must use the mass of the star for a course change. There was no room for error here.

Then on to the next target, which was even farther away. Corbett watched—and he absorbed—and a part of him seemed to have known everything all along even while another part was gasping at the distances. Ten stars, all yellow dwarfs of the Sol type, an average of fifteen light-years apart—though he would cross one gap of fifty-two light-years. He would almost touch lightspeed on that one. Oddly enough, the Bussard ramjet effect would improve at such speeds. He could

take advantage of the greater hydrogen flux to pull the fields closer to the ship, to intensify them.

Ten stars in a closed path, a badly bent and battered ring leading him back to the solar system and Earth. He would benefit from the time he spent near the speed of light. Three hundred years would pass on Earth, but Corbett would only live through two hundred years of ship's time—which implied some kind of suspended animation technique.

It didn't hit him the first time through—or the second, but repetition had been built into the teaching program. It didn't hit him until he was on his way to the exercise room.

Three hundred years?

Three hundred years!

III

IT WASN'T night, not really. Outside it must be midafternoon. Indoors, the dorm was always coolly lit, barely brightly enough to read if there had been any books. There were no windows.

Corbett should have been asleep. He suffered every minute he spent gazing out into the dorm. Most of the others were asleep, but a couple made noisy love on one of the loving bunks. A few men lay on their backs with their eyes open and two women talked in low voices. Corbett didn't know the language. He had been unable to find anyone who spoke English.

He suspected that there were two shifts, that someone slept in his bunk, mornings—but he could prove nothing. The slippery sheets must be fantastically easy to clean. Just hose them down.

Corbett was desperately homesick.

The first few days had been the worst.

He had stopped noticing the smell. If something reminded him he could sniff the traces of billions of human beings. Otherwise the odor was part of the environment.

But the loving bunks bothered him. When they were in use he watched. When he forced himself not to watch he listened. He couldn't help himself. But he had turned down two sign-language invitations from a small brunette with straggly hair and a pretty, elfin face. Make love in public? He couldn't.

He could avoid using the loving bunks, but not the exposed toilets. That was embarrassing. The first time he was able to force himself only by staring rigidly at his feet. When he pulled on his jumper and looked up a number of sleepers were watching him in obvious amusement. The reason might have been his self-consciousness or the way he dropped his jumper around his ankles or he may have been out of line. A pecking order determined who might use the toilets before whom. He still hadn't figured out the details.

Corbett wanted to go home.

The idea was unreasonable. His home was gone and he would have gone with it without the corpsicle crypts. But reason was of no use in this instance—he wanted to go home. Home to Miriam, who long since must have died of old age. Home to anywhere: Rome, San Francisco, Kansas City, Hawaii, Brasilia—he had lived in all those places, all different, but all home. Corbett had been a born traveler, "at home" anywhere —but he was not at home here and never would be.

Now they would take here away from him. Even this world of four rooms and two roofs—this world of elbow-to-elbow mutes and utter slavery, this world of which he knew nothing—would have vanished when he returned from the stars.

Corbett rolled over and buried his face in his arms. If he didn't sleep he would be groggy tomorrow. He might miss something essential. They had never tested his training. Read that. *Not yet, not yet . . .*

He dozed.

He came awake suddenly, already up on one elbow, groping for some elusive thought.

Ah.

Why haven't I been wondering about the biological package probes?

A moment later he did wonder.

What are the biological package probes?

But the wonder was that he had never wondered.

He knew what and where they were: heavy fat cylinders arranged around the waist of the starship's hull. Ten of these, each weighing almost as much as Corbett's own life-support system. He knew their mass distribution. He knew the clamp system that held them to the hull and could operate and repair the clamps under various extremes of damage. He almost knew where the probes went when released; it was just on the tip of his tongue—which meant he had had the RNA shot but had not yet seen the instructions.

But he did not know what the probes were for.

It was like that with the ship, he realized. He knew everything there was to know about a seeder ramship, but nothing at all about the other kinds of ramship or interplanetary travel or ground-to-orbit vehicles. He knew that he would be launched by linear accelerator from the moon. He knew the design of the accelerator—he could see it, three hundred and fifty kilometers of rings standing on end in a line across a level lunar mare. He knew what to do if anything went wrong during launch. And that was all he knew about the moon and lunar installations and lunar conquest, barring what he had watched on television two hundred years ago.

What was going on out there? In the two weeks since his arrival (awakening? resuscitation?) he had seen four rooms and two rooftops, glimpsed a fantastic city-scape from a bridge and talked to one man who was not interested in telling him anything. What had happened in two hundred years?

These men and women who slept around him. Who were they? Why were they here? He didn't even know if they were corpsicles or contemporary. Probably con-

temporary. Not one of them was self-conscious about the facilities.

Corbett had raised his buildings in all sorts of strange places, but he had never jumped blind. He had always brushed up on the language and studied the customs before he went. Here he had no handle, to start. He was lost.

If only he had someone he could really talk to!

He was learning in enormous gulps, taking in volumes of knowledge so broad that he hadn't realized how rigidly bounded they were. The State was teaching him only what he needed to know or might need to know some time. Every bit of information was aimed straight at his profession.

Rammer.

He could see the reasoning. He would be gone for several centuries. Why should the State teach him anything at all about today's technology, customs, geography? There would be trouble enough when he came back if he—Come to that, who had taught him to call the government the State? He knew nothing of its power and extent. How had he come to think of the State as all-powerful?

It must be the RNA training. With data came attitudes below the conscious level, where he couldn't get at them.

What were they doing to him?

He had lost his world. He would lose this one. According to Pierce, he had lost himself four times already. A condemned criminal had had his personality wiped four times. Now Corbett's beliefs and motivations were being lost bit by bit to the RNA solution as the State made him over into a rammer.

Was there nothing that was his?

HE FAILED to see Pierce at exercise period. It was just as well. He was somewhat groggy. As usual, he ate dinner like a starving man. He returned to the dorm, rolled into his bunk and was instantly asleep.

He looked up during study period the next day and found Pierce watching him. He blinked, fighting free of a mass of data on the attitude jet system that bled plasma from the inboard fusion plant that was also the emergency electrical power source—and asked, "Pierce, what's a biological package probe?"

"I would have thought they would teach you that. You know what to do with the probes, don't you?"

"The teaching widget gave me the procedure two days ago. Slow up for certain systems, kill the fields, turn a probe loose and speed up again."

"You don't have to aim them?"

"No, I guess they aim themselves. But I have to get them down to a certain relative velocity to get them into the system."

"Amazing. They must do all the rest of it themselves." Pierce shook his head. "I wouldn't have believed it. Well, Corbett, the probes steer for a terrestrial world with a reducing atmosphere. They outnumber oxygen-nitrogen worlds about three to one in this arm of the galaxy and probably everywhere else, too—as you may know, if your age got that far."

"But what do the probes do?"

"They're biological packages. Bacteria. The idea is to turn a reducing atmosphere into an oxygen atmosphere, just the way certain bacteria did it for Earth, something like fifteen-times-ten-to-the-eighth years ago." The checker smiled—barely. His small narrow mouth wasn't built to express any great emotion. "You're part of a big project, Corbett."

"Good Lord. How long does it take?"

"We think about fifty thousand years. Obviously we've never had a chance to measure it."

"But, good Lord! Do you really expect the State to last that long? Does even the State expect to last that long?"

"That's not your affair, Corbett. Still—" Pierce considered—"I don't suppose I do. Or the State does. But humanity will last. One day there will be men on those

worlds. It's a Cause, Corbett. The immortality of the species. A thing bigger than one man's life. And you're part of it."

He looked at Corbett expectantly.

Corbett was deep in thought. He was running a finger tip back and forth along the straight line of his nose.

Presently he asked, "What's it like out there?"

"The stars? You're—"

"No, no, no. The city. I catch just a glimpse of it twice a day: cubistic buildings with elaborate carvings at the street level?"

"What the bleep is this, Corbett? You don't need to know anything about Selerdor. By the time you come home the whole city will be changed."

"I know, I know. That's why I hate to leave without seeing something of this world. I could be going out to die—"

Corbett stopped. He had seen that considering look before, but he had never seen Pierce actually angry.

The checker's voice was flat, his mouth pinched tight. "You think of yourself as some kind of tourist."

"So would you if you found yourself two hundred years in the future. If you didn't have that much curiosity you wouldn't be human."

"Granted that I'd want to look around. I certainly wouldn't demand it as a right. Corbett, what were you thinking when you foisted yourself off on the future? Did you think the future owed you a debt? It's the other way around—and time you realized it!"

Corbett was silent.

"I'll tell you something. You're a rammer because you're a born tourist. We tested you for that. You like the unfamiliar—it doesn't send you scuttling back to something safe and known. That's rare." The checker's eyes said: *And that's why I've decided not to wipe your personality yet.* His mouth said, "Was there anything else?"

Corbett pushed his luck. "I'd like a chance to prac-

tice with a computer like the ship's computer-autopilot."

"We don't have one, but you'll get your chance in two days. You're leaving then."

IV

NEXT DAY he received instructions for entering the solar system. He was trying anything and everything to make contact, up to and including flashing his attitude jets in binary code. The teaching widget was fanatical on the subject.

He found that he would not be utterly dependent on rescue ships. He could slow the ramship by braking directly into the solar wind until the proton flux was too slow to help him. He could then proceed on attitude jets, using whatever hydrogen was left in the emergency tank. A nearly full tank would actually get him to the moon and land him there.

The State was through with him when he dropped his last probe. It was good of the State to provide for his return, Corbett thought—and then he shook himself. The State was not altruistic. It wanted the ship back.

Now, more than ever, Corbett wanted a chance at the computer-autopilot.

HE FOUND one more chance to talk to the checker.

"A three-hundred-year round trip—maybe two hundred, ship's time," said Corbett. "I get some advantage from relativity. But, Pierce, you don't really expect me to live two hundred years, do you? With nobody to talk to?"

"The cold sleep treatment—"

"Even so."

Pierce frowned. "You haven't studied medicine. I'm told that cold sleep has a rejuvenating effect over long periods. You'll spend perhaps twenty years awake and the rest in cold sleep. The medical facilities are automatic; I'm sure you've been instructed how to use them.

They are adequate. Do you think we'd risk your dying out there between the stars, where it would be impossible to replace you?"

"No."

"Was there anything else you wanted to see me about?"

"Yes." He had decided not to raise the subject—now he changed his mind. "I'd like to take a woman with me. The life-support system would hold two of us easily enough. I worked it out. We'd need another cold sleep chamber, of course."

For two weeks this had been the only man Corbett could talk to. At first he had found Pierce unfathomable, unreadable, almost inhuman. Since then he had learned to read the checker's face to some extent.

Now he watched Pierce decide whether to terminate Jerome Corbett and start over.

It was a close thing. But the State had spent considerable time and effort on Jerome Corbett. It was worth a try . . . And so Pierce said, "That would take up some space. You would have to share the rest between you. I do not think you would survive, Corbett."

"But—"

"Look here, Corbett. We know you don't need a woman. If you did you would have taken one by now and we would have wiped you and started over. You've lived in the dormitory for two weeks and you have not used the loving bunks once."

"Damn it, Pierce, do you expect me to make love in public? I can't."

"Exactly."

"But—"

"Corbett, you learned to use the toilet, didn't you? Because you had to. You know what to do with a woman but you are one of those men fortunate enough not to need one. Otherwise you could not be a rammer."

If Corbett had hit the checker then he would have done it knowing that it meant his death. And knowing

that, he would have killed Pierce for forcing him to it.

Something like ten seconds elapsed, during which he might have done it. Pierce watched him in frank curiosity.

When he saw Corbett relax he said, "You leave tomorrow, Corbett. Your training is finished. Goodbye."

And Corbett walked out.

THE DORMITORY had been a test. He knew it now. Could he cross a narrow bridge with no handrails? Then he was not pathologically afraid of falling. Could he spend two hundred years alone in the cabin of a starship? Then the silent people around him, five above his head, thousands to either side, must make him markedly uncomfortable. Could he live two hundred years without a woman? Surely he must be impotent.

He returned to the dorm after dinner. They had replaced the bridge with a slab of grass. Corbett snarled and crossed ahead of the guard—the guard had to hurry to keep up.

He stood between two walls of occupied bunks, looking about him. Then he did a stupid thing.

He had already refrained from killing the checker. He must have decided to live. What he did, then, was stupid. He knew it.

He looked about him until he found the slender darkhaired girl with the elfin face watching him curiously from near the ceiling. He climbed the rungs between bunks until his face was level with her bunk.

He remembered that the gesture he needed was a quick, formalized one; he didn't know it.

In English he asked, "Come with me?"

She nodded brightly and followed him down the ladder. By then it seemed to Corbett that the dorm was alive with barely audible voices.

The odd one, the rammer trainee.

Certainly a number of the wakeful had turned to lie on their sides to watch.

He felt their eyes on the back of his neck as he zipped open his gray jumpsuit and stepped out of it. The dormitory had been a series of tests. At least two of those eyes must belong to someone who would report to Pierce or to Pierce's bosses. But to Corbett they were just like the others, all the eyes curiously watching to see how the speechless one would make out.

And sure enough, he was impotent. It was the eyes—and he was naked. The girl was first concerned, then pitying. She stroked his cheek in apology or sympathy and then she went away and found someone else.

Corbett lay listening to them, gazing at the bunk above him.

He waited for eight hours. Finally a guard came to take him away. By then he didn't care what they did with him.

HE DIDN'T start to care until the guard's floating jeep pulled up beneath an enormous .22 long cartridge standing on end. Then he began to wonder. It was too small to be a rocket ship.

But it was one. They strapped him into a contour couch, one of three in a cabin with one window. There were the guard type and Corbett and a man who might have been Pierce's second cousin once removed. He had the window. He also had the controls.

Corbett's heartbeat quickened. He wondered how it would be.

It was as if he had suddenly become very heavy. He heard no noise except right at the beginning—a sound like landing gear being raised on an airplane. Not a rocket, Corbett thought—and he remembered the tricks a Bussard ramjet could play with magnetic fields. He was heavy and he hadn't slept a wink last night. He went to sleep.

When he awoke he was in free fall. Nobody had tried to tell him anything about free fall. The guard and the pilot watched him curiously to see what he would do.

"Screw you," said Corbett.

It was another test. He got the straps open and pushed himself over to the window. The pilot laughed, caught him and held him while he closed a protective cover over the instruments. Then he let go and Corbett drifted before the window.

His belly was revolving eccentrically. His inner ear was going crazy. His testicles were tight up against his groin and that didn't feel good either. He felt as if the elevator cable had snapped. Corbett snarled within his mind and tried to concentrate on the window. But the Earth was not visible. Neither was the moon. Just a lot of stars, bright enough—quite bright in fact—even more brilliant than they had been above a small boat anchored off Catalina Island one night long ago. He watched them for some time.

Trying to keep his mind off that falling elevator.

He wasn't about to get himself disqualified now.

THEY ATE aboard in free fall. Corbett copied the others, picking chunks of meat and potatoes out of a plastic bag of stew, pulling them through a membrane that sealed itself behind his pick.

"Of all the things I'm going to miss," he told the broad-faced guard, "I'm going to enjoy missing you most. You and your goddam staring eyes."

The guard smiled placidly and waited to see if Corbett would get sick.

They landed a day after takeoff on a broad plain where the Earth sat nestled in a row of sharp lunar peaks. One day instead of four—the State had expended extra power to get him here. But an Earth-moon flight must be a small thing these days.

The plain was black with blast pits. It must have been a landing field for decades. Enormous transparent bubbles with trees and buildings inside them clustered near the runway end of the linear accelerator, and spacecraft of various types were scattered about the plain.

The biggest was Corbett's ramship: a silver skyscraper lying on its side. The probes were in place, giving the ship a thick-waisted appearance. To Corbett's trained eye it looked ready for takeoff.

Corbett donned his suit first, while the pilot and guard watched to see if he would make a mistake. It was the first time he had seen such a suit off the teaching screen. He took it slowly.

There was an electric cart. Apparently Corbett was not expected to know how to walk on an airless world. He thought to head for one of the domes, but the guard steered straight for the ramship. It was a long way off.

It had become unnervingly large when the guard stopped underneath.

The guard said, "Now you inspect your ship."

"You can talk?"

"Yes. Yesterday, a quickie course."

"Oh."

"Three things wrong with your ship. You find all three. You tell me, I tell him."

"Him? Oh the pilot. Then what?"

"Then you fix one of the things, we fix the others. Then we launch you."

IT WAS another test, of course. Maybe the last. Corbett was furious. He started immediately with the field generators and gradually he forgot the guard and the pilot and the sword still hanging over his head. He knew this ship. As it had been with the teaching chair, so it was with the ship itself. Corbett's impotence changed to omnipotence. The power of the beast, the intricacy, the potential, the—the hydrogen tank held far too much pressure. That wouldn't wait.

"I'll slurry this now," he told the guard. "Get a tanker over here to top it off." He bled gas slowly through the gauge, lowering the fuel's vapor pressure without letting fuel boil out of the gauge itself. When he finished the liquid hydrogen would be slushy with frozen crystals under near-vacuum pressure.

He finished the external inspection without finding anything more. It figured; the banks of dials held vastly more information than a man's eyes could read through opaque titanalloy skin.

The airlock was a triple-door type, not so much to save air as to give him an airlock even if he lost a door somehow. Corbett shut the outer door, used the others as green lights indicated he could. He looked down at the telltales under his chin as he started to unclamp his helmet.

Vacuum?

He stopped. The ship's gauges said air. The suit's said vacuum. Which was right: Come to think of it, he hadn't heard any hissing. Just how soundproof was his helmet?

Just like Pierce to wait and see if he would take off his helmet in vacuum. Well, how to test?

Hah! Corbett found the head, turned on a water spigot. The water splashed oddly in lunar gravity. It did not boil.

Corbett doffed his helmet and continued his inspection.

There was no way to test the electromagnetic motors without causing all kinds of havoc in the linear accelerator. He checked out the telltales as best he could, then concentrated on the life-support mechanisms. The tailored plants in the air system were alive and well. But the urea absorption mechanism was plugged somehow. That would be a dirty job. He postponed it.

Did a flaw in his suit constitute a flaw in the ship?

He decided to finish the inspection. The State might have missed something. It was his ship, his life.

The cold sleep chamber was like a great coffin, a corpsicle coffin. Corbett shuddered at the sight of it—it reminded him of two hundred years spent waiting in liquid nitrogen. He wondered again if Jerome Corbett were really dead—and then he shook off the wonder and went to work.

No flaw there.

The computer was acting vaguely funny.

He had a hell of a time tracing the problem. There was a minute break in one superconducting circuit, so small that some current was leaking through anyway, by inductance. Bastards. He donned his suit and went out to report.

The guard heard him out, consulted with the other man, then told Corbett, "You did good. Now finish with the topping off procedure. We fix the other things."

"There's something wrong with my suit too."

"New suit aboard now."

"I want some time with the computer," said Corbett. "I want to be sure it's all right now."

"We fix it good. When you top off fuel you leave."

That suddenly, Corbett felt a vast sinking sensation. The whole moon was dropping away under him.

They launched him hard. Corbett saw red before his eyes, felt his cheeks dragged far back toward his ears. The ship would be all right—it was built to stand electromagnetic eddy currents from any direction.

He survived. He fumbled out of his couch in time to watch the moonscape flying under him, receding, a magnificent view.

There were days of free fall. He was not yet moving at ram speeds. But the State had aimed him inside the orbit of Mercury straight into the thickening solar wind. Protons. Thick fuel for the ram fields and a boost from the sun's gravity.

Meanwhile he had several days. He went to work with the computer.

At one point it occurred to him that the State might monitor his computer work. He shrugged it off. Probably it was too late for the State to stop him now. In any case, he had said too much already.

He finished his work at the computer and got answers that satisfied him. At higher speeds the ram fields were self-reinforcing—they would support themselves and the ship. He could find no upper limit to the velocity of a ramship.

With all the time in the world, then, he sat down at the control console and began to play with the ram fields.

They emerged like invisible wings and he felt the buffeting of badly controlled bursts of fusing hydrogen. He kept the fields close to the ship, fearful of losing the balance here, where the streaming of protons was so uneven. He could feel how he was doing—he could fly this ship by the seat of his pants with RNA training to help him.

He felt like a giant. This enormous, phallic, germinal flying thing of metal and fire! Carrying the seeds of life for worlds that had never known life, he roared around the sun and out. The thrust dropped a bit then, because he and the solar wind were moving in the same direction. But he was catching it in his nets like wind in a sail, guiding it and burning it and throwing it behind him. The ship moved faster every second.

This feeling of power, enormous masculine power—it had to be partly RNA training. At this point he didn't care. Part was him, Jerome Corbett.

Around the orbit of Mars, when he was sure that a glimpse of sunlight would not blind him, he opened all the ports. The sky blazed around him. There were no planets nearby and all he saw of the sky was myriads of brilliant pinpoints, mostly white, some showing traces of color. But there was more to see. Fusing hydrogen made a ghostly ring of light around his ship.

It would grow stronger. So far his thrust was low, somewhat more than enough to balance the thin pull of the sun.

He started his turn around the orbit of Jupiter by adjusting the fields to channel the proton flow to the side. That helped his thrust, but it must have puzzled Pierce and the faceless State. They would assume he was playing with the fields, testing his equipment. Maybe. His curve was gradual—it would take them a while to notice.

This was not according to plan. Originally he had

intended to go as far as Van Maanan's Star, then change course. That would have given him 2x15=30 years' head start, in case he was wrong, in case the State could do something to stop him even now. Fifteen years for the light to show them his change in course; fifteen more before retaliation could reach him.

It was wise; but he couldn't do it. Pierce might die in thirty years. Pierce might never know he had failed—and that thought was intolerable.

His thrust dropped to almost nothing in the outer reaches of the system. Protons were thin out here. But there were enough to push his velocity steadily higher and that was what counted. The faster he went, the greater the proton flux. He was on his way.

HE WAS beyond Neptune when the voice of Pierce the checker came to him, saying, "This is Peerssa for the State, Peerssa for the State. Answer, Corbett. Do you have a malfunction? Can we help? We cannot send rescue but we can advise. Peerssa for the State, Peerssa for the State—"

Corbett smiled tightly. *Peersa?* The checker's name had changed pronunciation in two hundred years. Pierce had slipped back to an old habit, RNA lessons forgotten. He must be upset.

Corbett spent twenty minutes finding the moon base with his signal laser. The beam was too narrow to permit sloppy handling.

When he had it adjusted he said, "This is Corbett for himself, Corbett for himself. I'm fine. How are you?"

He spent more time at the computer. One thing had been bothering him: the return. He planned to be away longer than the State would have expected. Suppose there was nobody on the moon when he returned?

It would be a problem, he found. If he could reach the moon on his remaining fuel (no emergencies, remember), he could reach the Earth's atmosphere. The ship was durable; it would stand a meteoric re-entry.

But his attitude jets would not land him, properly speaking.

Unless he could cut away part of the ship. The ram field generators would no longer be needed . . . Well, he would work it out somehow. Plenty of time. Plenty of time.

The answer took nine hours. "Peerssa for the State. Corbett, we don't understand. You are way off course. Your first target was to be Van Maanan's Star. Instead you seem to be curving around toward Sagittarius. There is no known Earthlike planet in that direction. What the bleep do you think you're doing? Repeating. Peerssa for the State, Peerssa—"

Corbett tried to switch it off. The teaching chair hadn't told him about an off switch. He managed to disconnect a wire. Somewhat later, he located the lunar base with his signal laser and began transmission.

"This is Corbett for himself, Corbett for himself. I'm getting sick and tired of having to find you every damn time I want to say something. So I'll give you this all at once.

"I'm not going to any of the stars on your list.

"It's occurred to me that the relativity equations work better for me the faster I go. If I stop every fifteen light-years to launch a probe, the way you want me to, I could spend two hundred years at it and never get anywhere. Whereas if I just aim the ship in one direction and keep going, I can build up a ferocious Tau factor.

"It works out that I can reach the galactic hub in twenty-one years, ship's time, if I hold myself down to one gravity acceleration. And, Pierce, I just can't resist the idea. You were the one who called me a born tourist, remember? Well, the stars in the galactic hub aren't like the stars in the arms. And they're packed a quarter to a half light-year apart, according to your own theories: It must be passing strange in there. I can't resist it.

"So I'll go exploring on my own. Maybe I'll find

some of your reducing atmosphere planets and drop the probes there. Maybe I won't. I'll see you in about seventy thousand years, your time. By then your precious State may have withered away. Or you'll have colonies on the seeded planets and some of them may have broken loose from you. I'll join one of them. Or—"

Corbett thought it through, rubbing the straight, sharp line of his nose. "I'll have to check it out on the computer," he said. "But if I don't like any of your worlds when I get back, there are always the Clouds of Magellan. I'll bet they aren't more than twenty-five years away, ship's time."

THE SHARKS OF PENTREATH

By Michael G. Coney

Michael G. Coney looks at the tourist problem of the future. Here is a bittersweet and haunting story of lonely people in love at a time when there is no longer room for wrong choices. You may want to read it twice before you say goodbye to . . .

THE SHARKS OF PENTREATH

DURING THE night there was a thunderstorm and I lay awake for some time as the scarlet curtains flared again and again to the incessant lightning. I got out of bed once and looked out across the harbor to the open sea flashing silver between the jagged black teeth of the twin headlands. I saw the boats heaving restlessly at anchor as the long waves rolled in and smashed against the stone quay, throwing high plumes of spray across the narrow waterfront street. I worried about the boats because two of them were assigned to me for my current Fulltime; I had rented them with good money.

Then I thought about Gordon Ewell's jerry-built Grotto down the road, and I felt better. He had not allowed for this sort of weather in May.

I went back to bed. As I shrugged my head deeper into the pillow I saw Sylvia's eyes flicker open in alarm when another crack of thunder shook the village. Thunder frightened her; I knew she was thinking of suggesting she get into my bed. So I turned the other way and went to sleep.

By breakfast time the storm had passed over and a watery sun glinted from the puddles and sea with unnat-

ural brilliance. We concluded our usual silent meal and I left Sylvia to wash up the things while I took a stroll down the street. Pentreath looked good that May morning and I hoped the weather would stay fine for the opening of the official tourist season. The facades of the buildings, freshly painted and gleaming with rain, looked much as they must have in the twentieth century and earlier; a rambling row of dissimilar stone and brick structures, some overhanging the street, some with jutting bow windows packed with curios, all restored with painstaking detail garnered from old photographs and picture postcards. Come to quaint Pentreath, the resort with character.

Nearly all totally fake, of course—the stone and brick mostly recreated from modern materials—the facades are just that; behind the solid-looking fronts are prefabricated rooms decked out with imitation oak and plaster, extraordinarily convincing. But my place is real —The Treasure Trove Gifte Shoppe and Tea Rooms is the identical building which has stood for centuries on Pentreath quay, a genuine ancient monument.

I had rented the Treasure Trove in the earlier days; in successive Fulltime years I had come here and Sylvia and I had worked damned hard. After four years of this, punctuated by eight years of careful Shelflife, I had bought the place. Now we should be set for life. During our periods of Shelflife I let the place out; on the income we are able to send our remotors almost anywhere we please to enliven the enforced idleness. But we seldom go together. In December of last year I had my remotor adapted for skiing and enjoyed the winter sports at St. Moritz while I lay in comfort at the Shelflife Center, secure in my steel cabinet. Sylvia, however, monitored the Christmas festivities at the Center; her remotor never stirred out of the building but sat chattering to the other machines belonging to those people on Rotomation One too impoverished to remotravel. I can never understand why Sylvia likes people so much.

I crossed the street to the quayside and checked the rope that secured my dinghy. A glance across the harbor satisfied me that *Daffodil* and *Skylark* still rode smoothly at anchor—their chains had held fast during the night. I didn't expect any boat customers today but in a week or two, when the season warmed up, the craft would be in use continuously, trotting remotors around the bay on fishing trips.

Turning, I walked over to Ewell's Grotto. Ewell himself was busy with a broom, ineffectively sweeping water out of the entrance in muddy waves.

"Much damage last night?" I enquired.

He looked up. His young, weak face was flushed with effort.

"Could be worse, Mr. Green," he replied. "One or two rips in the canvas, that's all." He hesitated. "I wonder—could Mrs. Green lend me a hand and stitch things up a bit?"

I didn't reply but strolled inside to inspect the damage. Fiberglass stalagmites lay around in confusion and the canvas hung awry. A gaping hole in one wall had allowed leaves and twigs to blow in and the fairy pool was full of muck. The place was a mess.

Ewell's Grotto is a temporary structure; he dismantles it at the end of each Fulltime year and packs it away while he takes his two years Shelflife. Consequently he doesn't pay local siterates. I find this sort of situation annoying; people of Ewell's type are parasites feeding off gullible remotourists while the rest of us foot the bill. My own siterates are heavy.

"Oh, dear. What a shame." I swung around on hearing Sylvia's voice. She was standing at the entrance, regarding the devastation with dismay. Ewell hovered at her side, eager for sympathy. "Look, Gordon," she continued, "I'll slip home and fetch the sailmaking things and get the canvas sewn up while John helps you clear up the mess. I won't be a minute."

She departed, leaving me in helpless irritation. It wasn't the first time she had volunteered my services to

help a competitor. Ewell was grinning at me gratefully—being unmarried, he is insensitive to nuances of behavior between married couples.

"Thanks a lot, Mr. Green," he said as we started to tidy the place up.

IT TOOK about an hour to get the Grotto presentable and set up Ewell's ridiculous little gift shop, a rough imitation rock counter at the back of the tent complex which Sylvia and he loaded carefully with worthless trinkets and postcards. I left Sylvia to help with the finishing touches and went out to see to the Herefords.

The Herefords are another of those touches of authenticity of which I am rather proud. The herd numbers twenty white-faced brown brutes of no practical purpose save to stand around the large field at the back of the waterfront street and look picturesquely rustic. Sylvia once tried making genuine Cornish Beef Pies for the Tea Room but the experiment was a failure. The few Fulltime tourists we get, together with the locals, found the variable consistency of real meat repulsive and quickly reverted to synthetics. The remotors, which constitute the vast majority of tourists, do not eat and seemed reluctant to burden themselves with perishable pies to take back to the Shelflife Centers.

On the strength of the Herefords, however, they do buy our Olde Englishe Clotted Cream which, laughably, is synthetic.

In the bright sun this morning the Herefords looked wonderful, posing in powerful attitudes against the background of grass, hillside and puffclouded sky—like a nineteenth-century oil painting. One of the animals, a large cow under a tall cedar, was bellowing realistically. For a moment I toyed with the idea of herding them down outside the back windows of the Tea Room but decided to leave that until later. In their present position they could be seen from the coach park at the top of the village.

I unlocked my small shed and took out the signs.

Labeling the cattle is a long job but worthwhile from an advertising point of view. The signs are large and heavy and I can only carry two at a time, so it was an hour before I had finished; but by ten o'clock each cow carried, slung across its broad back and hanging down either flank, twin boards reading: THE SHELFLIFE OF GREEN'S CREAM IS AS LONG AS YOUR OWN.

I surveyed the field and was satisfied. In the distance, over the crest of the hill, the sun reflected from the roofs of the approaching coaches.

BY THE time I reached the coach park the vehicles were arriving, groaning and spewing archaic diesel smoke. There were two, each about eight feet wide and thirty long with deep, unnecessary windows running the length of the sides. Painted scarlet, they bore the words MIDLAND RED along their sides. In front, just below the roof line, were placards reading ROTOMATION 2 and ROTOMATION 3.

They pulled into the park and halted side by side. The din of internal combustion ceased. The drivers jumped out, carrying lists, held a leisurely conversation, then strolled to the rear of the vehicles. I followed. I like to know the worst, right away.

I needn't have worried. The coaches were packed with remotourists. The driver of Rotomation 2 jerked open the twin doors and began to hand down the metallic boxes to his companion, who laid them carefully on the ground. I positioned myself above the first box, a cube with dimensions something under two feet, and waited while it shifted, lifted itself three feet from the ground on telescopic legs, then extended a slender, gleaming neck from the center of the cube. At the top of the neck was the head, cylindrical and about six inches in diameter, about level with my own.

The robot spoke, "Good morning," it said politely.

"Are you in charge of Rotomation 2?" I asked.

"That's right. Name's Tom Lynch. Gloucester Shelflife Center."

"John Green," I said, grasping the stubby hand projecting from the side of the cube, "of the Treasure Trove Gifte Shoppe and Tea Rooms." I produced my handout. "Here you are. You'll find us about halfway along the waterfront. I'll make it worth your while."

"Ah, Mr. Green." If it were possible for a remotor to stiffen, Lynch would have stiffened. "This tour is in no way regimented. I don't shepherd these people around. The idea is, they do what they want for the day."

I meet this type sometimes. "I'm aware of that." I tried to match his air of dignity. "But you're in a position to make suggestions. That's all I meant."

"Yes," replied the remotor ambiguously, turning away and allowing my handout to flutter to the ground. "On your feet, folks!" His voice became jovial as he addressed the gangling forms lurching around, getting used to their legs. "We've only got a day here. Get set to enjoy yourselves! Hurry! Hurry—"

Within a short while both coaches were unloaded.

"That's progress for you." The driver of Rotomation 2 spoke; he leaned against the side of his coach, smoking. "This used to be a forty-seater. Now it holds three hundred. Pack 'em in—" He chuckled cynically.

"That's the story of Rotomation," I agreed. "Why do you use these old vehicles?"

"Adds color to the deal. My company, we've got fifty of these. Used to take Fulltime tourists about but it didn't pay, not at forty to a coach. Even though the coaches are authentic and we charged accordingly. So we switched to remotors and advertised at the Shelflife Centers. Genuine tours just like grandpa used to take. Those your cows?"

"Yes."

"Nice touch. One thing I miss, though. I'm sixty, been driving all my life. Time was, years ago, I drove real tourists around, before Rotomation. Used to get girls, unaccompanied like." He sniggered. "Nowadays,

how do I know what they look like, one remotor is just like the next? You can't even tell the age, not unless you ask a remotor straight out. Look a bit silly when you find you're chatting up an old dear of seventy." He sighed. "Anyway, I'm getting a bit old for that game."

He looked it. Thin gray hair straggled across the parchment skin of his lined brow. Suddenly I tired of his reminiscences. The remotourists were pouring down the village in a silver tide and I had work to do. I walked away, leaving him staring ruminatively at his moist cigarette.

THE COACH park belongs to a friend of mine by the name of Charles Judd. He charges by the head and makes a good living from this and his remotor repair shop. He picked up the coach park cheap, too, from an old fellow disheartened by the fall in land values following Rotomation.

In order that the appearance of Pentreath remain unspoiled the local council insists on Charles' site at the cliff top being the only coach park near the village. Well away from the cluster of buildings at the waterfront, the park has a rough path leading down to the main street. The view is superb and gives a good initial impression to the remotourist.

Charles has an interesting sideline; he has affixed at the seaward side of the park a notice which states that persons descending to the beach by the cliff path do so at their own risk. The cliff path, as distinct from the proper path to the village, is barely negotiable.

The remotourist is naturally adventurous. He has little to lose; should his remotor be damaged in some stupid escapade he merely pays to have it repaired while himself lying in comfort at the Shelflife Center, experiencing exciting events through his imperiled robot's senses. I do quite well in heavy seas that way; the boats are comprehensively insured.

As a result many remotourists, rather than take the safe road to the village, will see Charles' sign and

attempt the cliff path. A Fulltime human can manage it if he has a strong head for heights, but remotors are not so agile.

And sure enough, as I passed the sign grinning to myself as always at the shrewdness of Charles' idea, I heard cries of help.

I hurried to the repair shop, a wooden shack at the village end of the park, and banged on the door. Charles appeared with a telescopic leg in his hand.

"You've got customers on the cliff path," I informed him.

His expression brightened. "Thanks," he said. He fetched a rope from inside the shack and hurried to the cliff-top. I tagged along to watch the fun.

"Hang on to this, will you, John?" He tied the rope about his waist and handed me the end. "Take a turn around that post. Not that I expect to fall; I could climb this cliff blindfold." He chuckled and scrambled over the edge. I paid the rope out, keeping it taut around the post. Presently there was a jerk. I began to pull in. Charles reappeared with a pair of remoters in tow. The rescue operation was slickly complete. "Fine," he said, dusting himself down. "That'll be twenty-five for the two of you, please." The remotors paid up without a murmur, digging the notes out of a large yellow bag.

I accompanied the robots down the sensible path to the village. They seemed not to be suffering from any shortage of cash; I wanted to get them into the Treasure Trove among the souvenirs.

"What a nice man," remarked one of the remotors. I saw from the name tag that it was a woman, Lucy Allbright. "How lucky that he happened to be around, Al."

Albert Allbright laughed. "Don't kid yourself, Lucy. He makes useful money from his rescue setup. And I wouldn't be surprised if our friend here were in on it, too."

"Not me," I said hastily. "I own a gift shop. My name's Green, by the way."

"Glad to meet you, Mr. Green." They introduced themselves unnecessarily. "You must be Green's Cream," remarked Al.

"We have to take some of that back," added Lucy.

"All genuine stuff," I murmured.

"I'm sure. We first came here over forty years ago, you know." I couldn't tell whether the statement was intended to be significant. "Haven't been back since. From where we are now, it looks much the same, doesn't it, Lucy?"

This couple must be pretty old, I decided. They were the sort of tourists we wanted. Sentimental and with money to spare.

I TOOK them to the Treasure Trove and introduced them to Sylvia. In minutes they were chatting with her like old friends—Sylvia has this effect on people—so I left the three of them at the table. The Tea Room seats about twenty-five and there were one or two Fulltime villagers in, drinking coffee and eating buns, generally adding a touch of local color. This is very necessary. Remotors do not, obviously, eat or drink—but remotourists like to sit down from time to time in an authentic atmosphere and watch other folks or chat with locals. The Tea Room, basically, serves as a meeting place where remotourists get to know each other in attractive surroundings, buy Green's Cream, and then wander around the Treasure Trove, spending the rest of their budget for the day.

I passed through the doorway that separates the Tea Room from the Shoppe and was pleased to find the latter full of chattering remotors lurching among the counters on spindly legs, spending freely.

Well satisfied, I let myself out and strolled along the waterfront to the Smugglers' Arms. The public bar at this hour was almost empty; Jack Rivers was swabbing the counter in desultory fashion, the air smelled of

disinfectant and the parrot was muttering unpleasantly to itself, occasionally plucking at the bars of its cage like an ill-tempered harpist. I ordered a pint and sat down.

"Aah, it be a fine mornin', stranger."

"For God's sake, Bert," I snapped. "It's me, Green."

"Oh, I beg your pardon, Mr. Green." The old man's eyes focused with rheumy difficulty. "All the same, I'll have a pint, please."

"Not from me you won't. Wait till the tourists start coming in."

Bert Jennings is the village character and quite good at it. His line is to trade homespun philosophy and weather forecasts for drinks while sitting in an ancient wheelback chair in the corner of the bar. The romotourists spot him and cluster around as he clutches an empty mug in both mittened, arthritic hands and tells them the history of the village in a quavering voice. After a while the remotors buy him a drink and move away, pick up a stone jar of homemade Cornish Mead to take back to the Center, and drift out into the street, to be replaced by further seekers after information. We have an arrangement in Pentreath. If a remotourist wants details of village history, we send them to Bert. While the rest of us sell souvenirs and experiences, he sells words.

I often wonder what happens while we are all on Shelflife and the village is in the hands of Rotomation 2 and 3. Do they, too, have their village sage? Once or twice while at the Center I have contemplated sending my remotor to Pentreath to find out exactly what goes on, but I have never gotten around to it; there are too many other places to see.

"Hi, John. Thanks for the customers." Charles Judd was standing at the bar. He handed me a beer.

"Thanks. I took them into the Tea Room after, and let Sylvia loose on them."

Charles smiled. "A wife in a millon. She makes

more money with her personality than you with all your schemes."

"I'm not too sure about that." I frowned. They don't know what it's like to live with somebody who seems to like everyone except me. "She sometimes forgets that we do all this for money."

"Come off it, John. You know you couldn't do without her."

I fought back my irritation. Barroom banter is not my line. "Sometimes I wish it were permissible to exchange Rotomations. I'd like to see some new faces."

"Fine," he chuckled. "Leave her with me. Oh, by the way—" He sat down, pulled his chair close. "I heard some disturbing news today. From a fellow on Rotomation Two, who came here last year, while Rotomation Three was in charge."

"Oh?"

"It seems they dropped prices all around and advertised the fact. It's the first I've heard about it. I don't think it'll be the last. This guy on Two wanted a small repair job done this morning. He called me a crook when I told him the price."

"What?" This was serious. Those of us who own our businesses let them to other Rotomations on the strict understandings that prices be maintained. "We'll have to put this before the Chamber of Commerce," I said.

"And I'll tell you another thing. Ewell's selling cream in his Grotto."

"What?" Poaching on one another's preserves is something we don't do. I got to my feet. "I'll deal with this right away. I'll have that little swine thrown out of the Chamber!"

"Hold it. He's not a member. His is a temporary structure. He doesn't pay local siterates either."

"I know that." I charged out of the bar, incensed. I had to see Sylvia immediately. She had helped Ewell set up his stall this morning. She must have seen the cream. What the hell was she thinking of?

I STORMED into the Tea Room to find Sylvia still seated at a table with the Allbrights. This did not improve my temper. She should have been showing them around the Treasure Trove by now. She looked up as I entered.

"Oh, John." She smiled at me brightly, insensitive to my mood. "Mr. Allbright was just telling me. Did you know—he knew this place before Rotomation? They spent their honeymoon here. He says the place has hardly changed."

"Sit down, Mr. Green." The remotourist waved me to a vacant chair. "That's right, Sylvia. Mind you, the people have changed. I don't suppose any of the old ones are left now."

"I wonder if you knew Bert Jennings," Sylvia said.

"Had you thought of taking a fishing trip?" I asked hastily.

"Bert Jennings? That wouldn't be young Bert—do you remember, Lucy? He showed us how to catch bass? I wonder now—" The remotor fell silent, thinking then: "Where can we find him?"

"He'll be in the Smugglers'. He's always there at this hour." Sylvia seemed determined to send our customers elsewhere.

"What luck," exclaimed Allbright. "We must have a word with him. I'm sure it's the same man. You know—" He looked around, cylindrical head pivoting, "You've done a wonderful job with this place. It's almost exactly as I remember it. You can't know what it means to Lucy and me to come back here and see it all again."

"Last time I suppose the village was packed with Fulltime tourists," Sylvia remarked.

"You can't imagine the crowds—of course, everyone was Fulltime then. It was two years before Rotomation came in—earth was crowded, believe me. You could hardly move. The roads were one solid traffic jam. But now, well, look at the coaches we came in. Three hundred people in such a small space. Oh, yes—Rotomation was a wonderful idea."

"And it solved the food problem, Al. Don't forget that," Lucy pointed out.

"Oh, yes. Things were getting difficult. I won't say we were starving—but some of us were hungry. Now—in two years Shelflife a person only consumes a few gallons of drip. Of course, we all eat during our Fulltime year but that's only one-third of the population."

"How do you enjoy Shelflife?" asked Sylvia. "After having known what it was like before."

"Fine. I'm packed away comfortably in Gloucester. I'm conscious of my mind and body being there but only when I think about it. In my first two years Shelflife I adapted completely. It seemed strange to go on Fulltime again when my Rotomation came round."

"The remotors are good," said Lucy, nodding her shining head in a way which somehow betrayed her real age.

I was still trembling with rage; I wanted to get Sylvia alone. I think they sensed it.

"Well." Allbright stood up suddenly. "We must be going. My, it feels good to be young again. My real body's pretty feeble now, you know."

In an effort to be polite I managed to join the conversation at last. "You won't try to take your wife down that cliff in your next Fulltime, then?"

I had been tactless. I could tell by the pause before he replied but I was too mad at Sylvia to care.

"We're truly young only once," he replied at last quietly. "It's always as well to make the best of things while you can, Mr. Green." He glanced from Sylvia to myself. "Remotors are good but they're no substitute for flesh and blood. We climbed that cliff over forty years ago. We won't do it again."

His wife spoke. "Where do you recommend we go now, dear?" she asked Sylvia.

"You must see Gordon Ewell's Grotto," she replied at once. "And then why not slip into the Smugglers' and have a word with Bert Jennings?"

"Fine. That would be interesting. Oh, and before we go, I must have some of your cream to take back."

"I shouldn't bother now," said Sylvia. "You don't want to carry it about all day. You can pick it up later. The Grotto sells it as well, if that's nearer for you."

THE SIGHT of a woman crying moves me to fury. It is unnecessary; an attempt to take unfair advantage, calculated to turn logical defeat into a moral victory. I suppose she expected me to apologize.

"And you can cut out the tears," I told her. "Once and for all, get it into your head that we're in this for the money. To save for our Shelflife so that we can send our remotors out anywhere we like and enjoy ourselves. We get people in and we *sell.* Is that clear?"

"But why can't we enjoy ourselves all the time?" she asked. "Do we have to behave like the other sharks in the village? Like your friend Charles?"

"Charles is okay. He's a good businessman. What about your friend Ewell and his fake Grotto?"

"John, everyone knows Gordon's Grotto is fake. The tourists know it. There's no pretense about it. Gordon's a nice fellow."

I could feel the rage boiling up again, a sick volcano in my stomach. "By God, anyone would think you were in love with that lousy little creep." I was losing control of myself; I seized her by the shoulders and shook her. "Are you, Sylvia? Are you?"

She bit her lip and gave me a patient look; I very nearly slapped her face. "You know I'm not, John," she said quietly. "I'm in love with you. But sometimes I wish you could be a bit less—hard. This isn't dog eat dog—that sort of life finished when Rotomation came in. There's plenty for all of us."

"And how the hell did he get to selling cream?" I raged. "You helped him this morning. You must have seen it."

"I didn't think—"

"Where does he get it from? Where does he get this fake cream he sells in his fake Grotto?"

"I believe it's the same brand as ours. He just puts a different label on it, as we do."

"What? He doesn't even have any cows—" My head was spinning; I felt dizzy with rage and frustration. I swung around and left Sylvia standing there, her cheeks wet, her eyes wide and stupid. I slammed out the back way and strode into the field. The Herefords were grouped around the rear of the building. My gun was in the wooden shed. The canvas of Ewell's Grotto shone white in the sun. My hands were wet and shaking.

THEY SAY a thunderstorm clears the air. This may be so in other parts of the country but it doesn't usually apply to Pentreath. Here a fine spell may be broken by a storm, which is often the precursor of further storms and endless drizzling rain, day after day.

But the late afternoon of the first day of the tourist season was still delightful. The sun continued to shine unabated and as I climbed the cliff path life seemed pretty good. I reached the grassy knoll at the top and turned to admire the view. Across the tiny bay, on the opposite headland, were the two coaches, children's toys in the hard light. The village lay beneath me, the boats bobbing at anchor as the ebbing remnants of last night's heavy seas slapped against the quay. The village street glittered with promenading remotors; the wreckage of Ewell's Grotto lay at the near end, canvas flattened and tent poles askew. There had been no customers for my boats but I was not particularly bothered; the Treasure Trove was doing well and I had decided to take the afternoon off; Sylvia and the assistants could cope.

"Lovely afternoon, Mr. Green."

I jumped, startled, and turned round. Two remotors were sitting further along the cliff, telescopic legs dangling over the edge.

"Oh, hello, Mr. Allbright—Mrs. Allbright. Yes, it's

very nice," I replied none too enthusiastically. I find I am happiest when alone—inane conversation bores me. I leave that to Sylvia.

"It must be very pleasant living here for your Full-time," remarked Mrs. A. "You're very lucky."

I don't like being told I'm lucky. "What do you do?" I asked.

"I work in a synthetics plant," replied Allbright. "Hard work for a man of my age. You have to watch the machinery. Particularly in January after the previous Rotomation goes off. There's never much maintenance done in December. They're too busy thinking what they're going to do with their Shelflife."

Across the bay a hooter brayed.

"Time to be getting back to the coaches," observed Allbright. They stood up. "Would you mind walking back with us, Mr. Green? I've got an idea which might interest you."

Together we descended to the village. "The Grotto looks a mess," I observed. "It's better to build solidly even if it does mean paying local siterates."

"I think it's a shame," said Mrs. Allbright. "You can tell a lot of work's gone into that place. When I saw those cows stampeding through and smashing it all up, I could have cried for the poor man."

"I wonder what set those cattle running," speculated her husband. "You could have lost a lot of money yourself, Mr. Green. Herefords are valuable beasts."

"I was lucky," I said. "You know, they've never done it before. I expect they were nervous after last night's storm and some sudden noise startled them. Although I can't say I'm too sorry about the Grotto. It's a fake. I feel it lowers the tone of the village."

"I think it's fun," said the old woman. "And how do you mean, a fake?"

"Well—it's not genuine."

She laughed. "Oh, dear. Well now, just tell me what is."

"My Herefords are genuine."

"In what way? Do they have any practical use as cows used to? Do the boats and the Smugglers' Haunt and your Tea Room—and Bert Jennings?"

"Bert Jennings?" I was puzzled and a little annoyed.

"Which is the real Bert Jennings?" she asked. "The old character who sits in the bar for one year out of three, putting on his act, or the remotor who goes skiing and flying and climbs Everest for the other two years? On a time basis it ought to be the remotor."

"Don't worry about it, Mr. Green." Allbright chuckled. "Lucy gets these moods. She has few illusions—both of us have. The point is, we came here on our honeymoon—ages ago—and we had a wonderful time. Today, after all these years, we thought we'd come back and see the old place. We didn't expect to find it quite the same and it wasn't. But it's still wonderful. You've all done a great job of maintaining the appearance; the sea is still here—and the beach and the harbor and the cliffs. It's still Pentreath. And as for fake souvenirs and synthetic cream and shabby sideshows, well, they had those forty years ago, too. I tell you, nothing's changed very much. There's no need to feel defensive about things here."

The path narrowed and they moved ahead. I saw they were actually holding hands. Two remotors holding hands, for God's sake, like a couple of starcrossed lovers. I thought about Sylvia and myself in forty years' time . . .

We were passing the Treasure Trove when he made his suggestion. The narrow street was full of gleaming remotors stilting their way toward the coaches.

"It used to be a guest house, you know. They put people up for the night as the Smugglers' did. Have you ever thought of doing so again in those bedrooms upstairs? Nobody else in the village does. I've asked."

"But we don't get guests," I objected. "Everyone works during Fulltime except the very rich and they go abroad."

"I mean putting remotors up in proper rooms, in

beds, instead of just packing them away for the night. It'd be a novel idea. You could advertise all-inclusive fishing weeks."

"Remotors in beds?" I couldn't help laughing—the idea seemed so ridiculous.

"No, I'm serious. Lucy and I would have enjoyed staying in a real bedroom and having a whole week here. Delivery could be arranged with the coach people. After all, even remotourists get tired of rushing from place to place all the time, particularly the older ones like us."

Most tourists, if you allow yourself to get drawn into conversation, will make suggestions as to how trade could be improved. I thought I'd heard it all—from paddle steamers to traveling circuses. But I'd never before heard of letting furnished bedrooms to remotors. They cannot experience discomfort, so what's wrong with the trundling coach, which saves overnight time between one stop and the next? And in any case, why should anyone want to spend more than one day in any place? The truth of the matter was, they were a couple of sentimentalists who wanted to relive their ancient honeymoon in as much detail as possible. Fulltime traveling is expensive and cuts into valuable money-earning days.

I was still chuckling to myself as, hand in steel hand, they climbed the hill to the coach park. The shadow of the setting sun pursued us up the slope; the village was in dusk against the crimson-capped black hillside.

We reached the coaches. Allbright extended a silver claw. "Goodbye, Mr. Green," he said. "Would you say thank you to Sylvia for us for making our day so pleasant."

He turned to his wife. "Bye, Lucy," he said.

"See you in Bristol, Al." They stood in silence for a moment, then slowly Mrs. Allbright withdrew herself into a cube. The coach driver, damp cigarette adhering to his lower lip, picked up the remotor and slid it into the rear entrance to the vehicle.

Allbright turned away and stalked across to the other coach. I followed, puzzled. "What goes on?" I asked.

"This is my coach," he replied shortly.

"I don't understand," I muttered. I suddenly got an inkling of something I didn't want to know.

"It's quite simple, Mr. Green. Lucy and I married young and hastily. Soon we fought. I think you know how married couples can fight. We thought we hated each other. In two years we were divorced. Single people again. Free. You understand?"

"No." But I understood. Oh, God, I understood.

"Rotomation came along. They put us on different shifts. We kept in touch and met again as remotors. There are certain things in life we find out too late. Mistakes we cannot correct."

It is not permissible to exchange Rotomations.

"I haven't seen Lucy—*seen* her—for forty years."

He stiffened and began to sink to the ground. I watched.

At my feet was a silver box with hairline cracks on the top.

An inert, lifeless silver box; the driver lifted it into the coach.

A piece of precision machinery.

A cube.

I turned and ran toward the setting sun, toward the village, Sylvia. The sun must have been strong because my eyes were smarting.

OUT OF PHASE

By Joe Haldeman

Follow the madcap adventures of innocent youth as Braxn the G'drellian plays with the insignificant inhabitants of a small planet in the orbit of a lower-magnitude yellow star on the fringe of the galaxy. Here's the story behind the headlines—from the viewpoint of an ancient transgalactic intelligence. Get set for a bumpy ride as Joe Haldeman shifts . . .

OUT OF PHASE

TRAPPED. FROM the waterfront bar to a crap game to a simple-minded ambush in a dead-end alley.

He didn't blame them for being angry. His pockets were stuffed with their money, greasy and crumpled fives and tens. Two thousand and twenty of their hard-earned dollars, if his memory served him right. And of course it did.

They had supplied three sets of dice—two loaded, one shaved. All three were childishly easy to manipulate. He let them win every throw at first, then less and less often. Finally he tested their credulity and rapidly emptied their pockets with ten sevens in a row.

That much had been easy. But now he was in a difficult position. Under the transparent pretext of finding a bigger game, the leader of the gang had steered him into this blind alley, where five others were hiding in ambush.

And now the six were joined in a line, advancing on

him, pushing him toward the tall hurricane fence that blocked the end of the alley.

He started pacing them, walking backward. Not that they could do any physical harm to him. But he needed time. Only thirty seconds, give or take a little, before he would back into the fence and be caught.

Thirty seconds objective . . .

He froze and did a little trick with his brain. All the energy his strange body produced, except for that fraction needed to maintain human form, was channeled into heightening his sensory perceptions, accelerating his mental processes. He had to find a way out of this dilemma without exposing his true nature.

The murderous sextet seemed to slow down as the ratio of subjective to objective time flux increased arithmetically, geometrically, exponentially.

A drop of sweat rolled from the leader's brow, fell two feet in a fraction of a second, a foot in the next second, an inch in the next, a millimeter, a micron . . .

Now.

A pity he couldn't just kill them all slowly and painfully. Terrible to have artistic responsibility stifled by practical considerations. Such a beautiful composition; a spectrum of attitudes ranging from the little one's ill-concealed fear of pain, of inflicting pain, to the leader's leering, sadistic anticipation of pleasure in the kill—the dilettante!

A smallish work, only six to play on. Still, he ought to practice on some little piece before the great epic. But it might arouse suspicion.

And Llarval said . . .

That snail. Insensitive brute . . .

Next time out I'll get me a supervisor who is able to understand . . .

But next time out, I'll be too old . . .

Even now I can feel it . . .

Damn that snail!

THE SHIP hovered above a South American plantation.

People looked at it and saw only the sky. Radar would never detect it. Only a voodoo priest in a mushroom trance felt its presence. He tried to verbalize and died of a cerebral occlusion.

Too quick. Artless. Braxn was kind of ashamed of it.

"Bluntly, I wish we didn't have to use you, Braxn." Llarval was talking.

His crude race communicated vocally and the unmodulated, in-and-out-of-phase thought waves washed a gravelly ebb and flow of pain through Braxn's organ of communication. He stored the pain, low intensity that it was, for contemplation at a more satisfactory time.

Llarval repeated: "If only we had brought someone else of your sort—besides your father, of course. Shape-changers aren't such a rarity."

He plucked out a cilium in frustration but of course felt no pain. Braxn was too close, sucked it in.

"A G'drellian poet. A poet of pain. Of all the useless baggage to drag around on a survey expedition—" Llarval sighed and ground his shell against the wall. "But we have no choice. Only two bipeds aboard the ship and neither of them is even remotely mammalian. And the natives of this planet are acutely xenophobic. Hell, they're omniphobic. Even harder to take than you, worthy poet. But this is the biggest find of the whole trip! The crucial period of transition—they may be on the brink of civilization, still animals but rapidly advancing. Think of it! In ten or twenty generations they may be human and seek us, as most do."

The shapeless blob that was Braxn was turning a bored shade of green.

"We've met thousands of civilized races—more thousands of savage ones—but this is the first we've ever found in transition, correct: Ethnology, alien psychology, everything—" Llarval shuddered—"even your people's excuse for art, will benefit immeasurably."

Braxn had his doubts but he made no comment. He hadn't bothered to form a speech organ for the inter-

view. He knew Llarval would do all the talking anyway.

But Braxn had been studying, under stasis, for several hours. Knowing exactly what needed to be done, he let most of his body disintegrate into its component parts and started to rebuild.

First the skeleton, bone by thousandth bone; the internal organs, in logical order, glistening, throbbing, functioning; wet-red muscle, fat, connective tissue, derma, epidermis smooth and olive, fingernails, hair, small mole on the left cheek.

Vocal cords, virgin, throb contralto: "Mammalian enough?"

"Speak Galactic."

"I said, 'Mammalian enough?' I mean, would you like them bigger—" she demonstrated—"or smaller?"

"How would I know?" snapped Llarval, trying to hide his disgust. "Pick some sort of statistical mean."

Braxn picked a statistical mean between the October and the November Playmate of the Month.

With what he thought was detached objectivity, Llarval said, "Ugly bunch of creatures, aren't they?"

About a hundred million years ago, Llarval's prehistoric ancestors had known one natural enemy—a race of biped mammals.

With a silvery laugh Braxn left to prepare for planetfall.

He got a kick, for the moment, out of being a "she."

BRAXN HAD studied Earth and its people for some ten thousand hours, subjective time. She knew about clothes. She knew about sex. She knew about rape.

So she appeared on Earth—on a dirt road somewhere in South America—without a stitch and without a blush. And her scholastic observations were confirmed in the field, so to speak, in less than five minutes. She learned quite a bit the first time, less the second. The third time, well, she was merely bored.

She made him into a beautiful—poem?

She made him into a mouse-sized, shriveled brown husk lying dead by the side of the road, his tiny features contorted with incredible agony.

She synthesized clothes, gray and dirty, and changed herself into an old, crippled hag. It was twenty minutes before she met another man, who . . .

Another dry husk.

Braxn was getting an interesting, if low, opinion of men, Bolivian farmers in particular. So she changed herself into one. The shoe on the other foot, she found, made things different but not necessarily better. Well, she was gathering material.

She waited for a car to come by, reverted to the original voluptuous pattern, disposed of the driver when he stopped to investigate, took his form and his car and started on a world tour.

BRAXN TRIED to do everything and be everyone.

He was in turn a doctor, lawyer, fencing coach. Prostitute, auto racer, mountain climber, golf pro. He ran a pornography shop in Dallas, a hot-dog stand at Coney Island, a death-sleep house in Peking, a Viennese coffee house, the museum at Dachau. He peddled Bibles and amulets, Fuller brushes and heroin. He was a society deb, a Bohemian poet, a member of Parliament, a *cul-de-jatte* in Monaco.

For operating expenses, when he needed small sums, he wove baskets, sold his body, dived for pennies, cast horoscopes.

Threw dice.

THE SWEAT drop had moved a hundredth of an inch.

Must stop wasting time but it's so hard to concentrate when it feels as if you had all the time in the universe . . .

Braxn knew that he could remain in this state only a few more minutes (subjective) before he was stuck in it permanently. On the ship he could spend as much time as he wanted in mental acceleration but here there was

no apparatus to shock him out of it before trance set in. The trance would go on for more than a thousand years, such was his race's span of life. But to the six hoods he would age and die in a few seconds, reverting to his original form for an invisible nanosecond before dissolving into a small gray mound of dust.

He was seeing in the far infrared now and definition was very poor. He switched to field recognition. The dull animals confronting him had dim red psionic envelopes, almost completely washed out by his own, a crackling, stroboscopic violet.

Electromagnetic. The ion fog around the leader's watch glowed pale blue. Leakage from the telephone and power lines made kaleidoscopic patterns overhead. His back felt warm.

Warm?

He switched to visual again and searched the people's eyes for reflections. There—the little scared one—his eyes mirrored the fence, the hurricane fence. Gate spaced with ceramic insulators.

He started to slow down his mind, speed up the world. The drop inched, fell to the ground with slow purpose; struck and flowered into tiny droplets.

Sound welled up around him.

"—on't have to use the gun."

Braxn stumbled back toward the electrified fence, manufacturing adrenalin to substitute for his spent strength. His stomach knotted and flamed with impossible hunger. He received the pain and cherished it.

The leader advanced for the kill, bold and cocky, switchblade in his right hand, his left swinging a bicycle chain like a stubby lariat.

Braxn secreted a flesh-colored, rubbery coating over his body and, on top of that, a thin layer of saline mucus.

"Left-handed retiarius," he mumbled under his breath.

The leader brought the chain around in a swift, flat

arc, face-high. Braxn reached back and made contact with the fence.

The chain cracked Braxn high on the right cheekbone and whipped around the back of his head, the end of it putting out his left eye. There was a low, sixty-cycle hum. His good eye saw the hood give one spastic jerk and crumple to the ground.

He looped the chain around the little one's neck and pulled him into the fence. Four to go.

They had backed away, somewhat bewildered. One took a step toward Braxn, faltered, then turned and ran. The others bolted and followed him.

Basking in the pain of his shattered face, Braxn leisurely reached out with his mind and sorted their garbled thoughts. Unfortunately all four had grasped the significance of his trick with the fence and none should be allowed to spread the tale, however unbelievable.

To buy time he stopped the blood flow to their brains temporarily. Each one collapsed before he reached the end of the alley. He carried them back and carefully arranged them around the fence. Carefully, for it was delicate work, Braxn erased their memories of the past few hours. He substituted the memory of an elaborate and vicious practical joke which ended with all of them being knocked unconscious by the charge from the fence.

All fixed up. But time enough for a special little treat for the leader, Cleve, who had caused him to go to all this trouble.

He studied the man's still figure. Dirty blond hair, low forehead, drooping moustache not quite hiding an unsightly mole at the corner of his mouth. Black leather shirt tight over flaccid muscles, beer belly, faded blue jeans tucked into black boots.

With little effort Braxn redid his own exterior in the shape of Cleve. But he took the details, not from reality but from the twisted self-image in Cleve's dim brain.

Thus the biceps were a little larger, the face a little

meaner than a lying mirror would reflect. Flat belly and hair blond almost to the point of whiteness. Instead of the ugly mole there was an incredibly virile scar that lanced down to his chin, catching the corner of his mouth down into an arrogant sneer. Grade-B movie syndrome.

He manipulated a couple of glands and the real Cleve woke up instantly. He caught sight of Braxn. His eyes narrowed and he rose slowly to his feet. He kept his distance and stared.

Sure of Cleve's attention, Braxn started his performance.

The strong, manly face blurred for an instant and came back into focus. The scar was a puffy, infected seam that defiled a face no longer vigorous or handsome. It pulled down the lower lip to expose a yellow canine. The face was lined with a delicate tracery of worry and pain, the grooves growing deeper and more complex in front of Cleve's horrified eyes.

The hair, sprinkled with gray, grew white and was gone except for a dirty stubble on the twisted, knobby chin. Face and body wasted away. Wrinkled parchment stretched tight over a leering death-mask.

Bloodshot eyes clotted with rheum. Cataracts clouded and blinded them. The lids closed and collapsed inward and the body—real only in the minds of two disparate creatures—was mercifully dead.

The skin turned gray, then olive, and released its life-grip on the ancient body. The body puffed up again in macabre burlesque of its younger brawn. It lived again for a short time as maggots fed on its putrescence.

Then a dry, withered husk, still standing upright. The last vestiges of skin and flesh sloughed off to reveal a brown-stained skeleton filled with nameless cobwebs. It collapsed with a splintering clatter.

On top of the pile of gray dust and bones the yellow skull glared balefully at Cleve for a long moment and

then, piece by piece the whole grisly collection started to reassemble itself.

Cleve had been trying to scream for nearly a minute. Finally he let out a little squeak and fainted.

Braxn made sure he would be out for a while, then erased from Cleve's memory the specific details of the experience. He left only a gnawing, undirected feeling of horror.

He scanned the silent forms around him and found that they were all still unconscious. One, the little one, was dead. Probing further, Braxn dissolved a blood clot, patched an infarction and shocked the still heart back into action. Pity to spoil good art. He liked the combination of cause-and-effect and dumb luck causing only the harmless one to die. Survival of the fittest, eugenics will out, and all that. With a mental shrug Braxn walked off to find a cab.

"OH, ENTER, by all means." Llarval slipped into the Survey Chief's cabin with trepidation. He was in for a bad time.

The Chief, who looked like a cross between a carrot and a praying mantis, got right to the point.

"Llarval, your reports stopped coming in several cycles ago. From this I infer that A) your scout is dead, not likely; B) he got disgusted with your asinine questions and lectures, rather more likely; or C) he went on one of his blasted binges and is busily turning the autochthones into quatrains and limericks. I find this last alternative the most probable, if the least palatable. He is a G'drellian, and adolescent at that. Do you know what that means?"

"Yes, sir. That means he's in the aesthetic stage of hi—"

"It means he should have been locked up before we got within a parsec of this primitive world. You should not have sent him down on the surface of this world alone, least of all without consulting your captain. You may be—you may have been—in charge of ethnologi-

cal research but certain decisions are not implemented without my okay."

"But sir, after his initial experiments he stopped killing them. I made him stop. He might have drawn attention to himself."

"Your devotion to objectivity is most commendable."

"Thank you, sir."

"It shows that you know and appreciate the first rule of contact." He pressed a stud and one wall became transparent. He gestured at the busy scene beneath them. "Are they aware of our presence?"

"Of course not, sir. That is the first rule."

"Tell me, Llarval. What sort of radiation would you suppose their eyes are sensitive to?"

The captain's addiction to obliqueness was most exasperating.

"Well, sir, since their planet goes around a yellow star, their organs of vision are most sensitive to a narrow band of radiation centered around the yellow wavelengths."

The captain scraped his thorax with a claw. Llarval interpreted this as applause. His race had forgotten sarcasm eons before the captain's had invented fire.

"You are a good study, Llarval."

"Thank you, sir."

"So we make the ship transparent to these wavelengths at great expenditure of power."

"Yes, sir. So the natives' development won't be influenced by premature knowledge of—"

"And with similar expenditure of power we extend this transparency down to the longer wavelengths. Why do we do this, Llarval?"

The little ethnologist was perplexed. Even the lowliest cabin boy could answer these questions.

"Why, of course, sir, it's to make the ship invisible to radar detection. Only it's not really invisible. It's just that the local implicit coefficient of absorption becomes asymptotic with—"

"Llarval." The captain sighed. "I learned one of

those creature's words the other day. I suppose by now you've run into it also—catechism."

"Yes, sir." Llarval squirmed.

"Now as far as I can tell, though I'm not a man of learning myself, this is a form of stylized debate. One person asks a series of questions. The answers are so simple that they brook no disagreement or misinterpretation. These answers—forced, as it were, upon the hapless interrogatee—lead to an inevitable conclusion, which gains a spurious validity through sheer tautological mass. Is that fairly accurate?"

Llarval paused for a second to retrieve the sentence's verbs as the captain had mischievously, if appropriately, switched from English to Middle High German.

"Yes, sir. Very accurate."

"Well, then." The captain gave a gleaming, metallic smile. "To borrow another of their delightfully savage concepts, the *coup de grace*. How did we know—long before we came within range?—"

"Radio broadcasts, sir, and television."

"Which means?"

"Sir, I'm aware of—"

"You're aware of the fact that our arty friend could gain control of this planet-wide network and, in a matter of seconds, destroy almost every intelligent being on the planet. Or perhaps worse, reduce them to gibbering animals. Or worse still, increase their understanding of themselves beyond the threshold—"

"Yes, sir."

Llarval could fill in the blanks.

"Then, get out of here and let more capable minds deal with the situation."

"Yes, sir."

The ethnologist started to scuttle toward the door.

"And, Llarval—remember that your captain, like most of the members of this expedition, normally communicates mind-to-mind and receives your surface thoughts even when they are not verbalized."

"Yes, sir," he said meekly.

"Your captain may be a 'pompous martinet,' yes, but really, Llarval—'a vegetable that walks like a man'? Racism is, I think, singularly inappropriate in an ethnologist. Make an appointment with the psychiatric staff."

"Yes, sir."

"And on your way down, check at the galley and see if Troxl has a couple of years' work for you to do."

The captain watched the disconsolate creature scurry out. He settled down at his desk. He passed a claw over a photosensitive plate.

Computer, he thought.

Here, Captain . . .

Where the hell is that G'drellian poet?

The machine thought a low hum.

I can't find him. He must be generating a strong block. You know a G'drellian can synthesize dummy thought waves exactly out of phase with his natural pattern. And by combining the two patterns . . .

How do you know he isn't just on the other side of the planet?

The captain sighed. A computer will talk on one subject forever, if you let it.

Using the planet's satellites as passive reflectors, I can cover ninety percent or more of the planet's surface. And by integrating the fringe effects from . . .

I believe you, I believe you. Then tell me—where is his old goat of a father?

Meditating in the meat locker—in the form of a large stalactite. As he has been, I might add, ever since you . . .

All right. Have Stores send me up a winter outfit. I'll have to go and try to blackmail him into telling me where his blasted progeny is.

Give him a thousand witless ethnologists, thought the captain to himself. Give him a thousand garrulous computers but spare him the company of even one G'drellian. Even on G'drell they confined the adolescents to one island—to work out their poetry on worms and insects and each other.

A survey expedition needed a G'drellian, of course. A mature one to solve problems beyond the scope of the computer. But damn that Brohass! He must have known he was gravid when he volunteered for the trip. How did one deal with these creatures, who seem to live only to torment other people with their weird, inscrutable sense of humor? Brohass knew he would undergo fission, knew his offspring would reach adolescence in mid-voyage—and probably contrived to send the ship to a planet where . . .

The captain's reverie was broken by the robot from Stores.

"The clothing you requested, sir."

"Just put it on the hook there."

The robot did so and glided out of the room.

He should have had it delivered to the locker, thought the captain. Clothing was tantamount to obscenity to many of the crew members and one had to maintain dignity.

Yes, one must, mustn't one? thought the computer.

Will you go do something useful?

The captain threw up a block in time to miss the reply. He jerked the clothes off the hook and strode out of the cabin, letting out occasional thoughts about the ancestry, mating habits, etc., of the machine that was the ship's true captain.

"FASTEN YOUR seat belts, please." The slender stewardess swayed down the aisle, past a young man with a handsome, placid face and a Brooks Brothers suit. "Landing at Kennedy International in three minutes."

Braxn did as told, shifting the heavy attaché case from his lap to the floor. Two hundred pounds of gold bullion would buy a lot of prime time.

They landed uneventfully. Braxn took a helicopter to the Pan American Building, went down to the 131st floor and into an office. Gold leaf on the frosted glass entrance proudly proclaimed Somebody, Somebody and Somebody, Advertising Counselors.

He came out two hundred pounds lighter, having traded the gold for one minute of time—at nine Saturday night, an hour away—on each of the major television and radio networks. A triumph of money over red tape. His commercial would be strictly live, with no chance of FCC interference. And his brand of soap would certainly make the world a cleaner place to live in.

Alone.

THE CAPTAIN donned his thermal underwear and entered the massive locker. Sure enough, there was a huge blue stalactite suspended from the ceiling. He addressed it.

Brohass, he thought obsequiously, *would you serve your captain?*

The huge icicle fell and splintered into several thousand pieces. They reassembled into a creature who looked rather like the captain.

"What would you do to me if I said no?"

"That's ridiculous," said the captain, somewhat emboldened by facing a familiar shape. "No one can do anything to harm you."

"All right, that settled, will you please go and let me get back to my conversation."

Curious in spite of himself, the captain asked, "Whom are you conversing with? You don't generally think with the other crew members."

"My father has found a particularly humorous ninth-order differential equation. He is explaining it to me and I would like to devote all of my energy to understanding."

The captain shivered, not just from cold. Brohass' father had been dead for thirty years. But half of him would live as long as Brohass lived—a quarter would live as long as Braxn. And so on down the line. It was unsettling to mere mortal beings, that a G'drellian maintained an autonomous existence within his decendants for hundreds of thousands of years after physical death.

Whether a G'drellian would ever die completely was problematical. They claimed that none yet had.

"This won't take much of your time. I want you to locate Braxn and give him a message."

"Why can't you find him yourself?"

"It's a rather large planet, Brohass, and he's thrown up a strong communication block."

"We're on a planet? Which one?"

The captain thought a long string of figures. "They call it Earth."

"I'm afraid I'm unfamiliar with it. Please open your mind and let me extract the relevant details."

The captain did so, with chagrin. Brohass could easily have asked the computer but his people were born voyeurs and never would pass up the chance to probe another's mind.

"Interesting, savage—I can see why he was drawn to it. Incidentally, your treatment of Llarval was shameful. In his place you would have lost control of my son just as quickly. And your knowledge, Captain, of the people on this planet, is encyclopedic but imperfect. You misunderstand both catechism and tautology. You used the expression *coup de grace* where *coup de theatre* would have been more fitting. And your Middle German would send a Middle German into convulsions. Furthermore, you *are* an ambulatory vegetable. To your credit, however, you were correct in assessing my son's plans. He is now in the possession of a minute of time, as they say, on the planet's communications network. Funny idea, that—beings possessing time rather than the other way arou—"

"Brohass!"

"Captain?"

"Aren't you going to do anything?"

"Interfere with my child's development?"

"He's going to kill four billion entities!"

"Yes—he probably is. Mammals, though. You have to admit they'd probably never make anything of themselves anyhow."

"Brohass, you must stop him."

"I'm pulling your spindly leg, Captain. I'll talk to him. Just once, just once I would like to have a captain who could take a joke. You know, you vegetable people are unique in the civilized universe in your—"

"How much time do you have?"

"Oh, two thousand three hundred thirty-eight years, four days and—"

"No, no—how much time before Braxn gets on the air?"

"If Braxn got on the air he would fall to the ground—even as you and I."

The captain made a strangling noise.

"Oh, don't bust a root. I have several seconds yet." Brohass reverted to his native formlessness and sent a tendril of thought through his son's massive block.

BRAXN. THIS *is your father. Will you slow down just a bit?*

Braxn concentrated and the bustling studio slowed down and froze into a tableau of suspended action. *Yes, Father. Is there something I can help you with?*

Well, first, tell me what you're doing in a television studio.

At the minute of maximum saturation I'm going to broadcast the Vegan death-sign. That's all.

That's all? You'll kill everybody.

Well, not everybody. Just those who are watching television. Oh, yes, I've worked out a phonetic equivalent for simultaneous radio transmission. Get a few more that way—if it works.

Oh, I'm sure you can do it, son. But, Braxn, that's what I wanted to think to you about.

You're going to try to think me out of it.

Well, if you want to put it that way . . .

I bet that joke of a captain put you up to it.

You know that vegetable that walks like a man . . .

Hey; that's a good one, Father. When'd you . . .

Neither he nor anyone else on this tin can could

make me do anything that I . . . Brohass sighed. *Look, Braxn. You're poaching on a game preserve. Worse, shooting fish in a barrel. With a fission bomb, yet. How can you get any satisfaction out of that?*

Father, I know that quantity is no substitute for quality. But there are so many here!

Brohass snorted.

And you want to be poet laureate, right?

There's something wrong with that? This will be the biggest epic since Jkdir exterminated the . . .

Braxn, Braxn—my son. You're temporizing. You know what's wrong, don't you? Surely you can feel it.

Braxn fell silent as he tried to think of a convincing counter-argument. He knew what was coming.

The fact is that you are maturing rapidly. It's time to put away your blocks—sure, you can go through with this trivial exercise. But you won't be poet laureate. You'll be dunce of the millennium, prize buffoon. You're too old for this nonsense. I know it, you know it and the whole race would know it eventually. You wouldn't be able to show your mind anywhere in the civilized universe.

He knew that his father was thinking the truth. He had known for several days that he was ready for the next stage of development but his judgment was blinded by the enormity of the canvas he had before him.

Correct. The next stage awaits you and I can assure you that it will be even more satisfying than the aesthetic. You have a nice planet here and you might as well use it as the base of your operations. The captain is easily cowed—after I assure him that you no longer wish to, shall we say immortalize these people in verse, he'll be only too glad to move on without you. We'll be back to pick you up in a century or so. Goodbye, son.

Goodbye, Father.

The filament of the green light on the camera facing him was just starting to glow. He had something less than a hundredth of a second.

Extending his mental powers to the limit, he traced

down every network and advertising executive who knew of the deal he had made. From the minds of hundreds of people he erased a million memories, substituting harmless ones. Two hundred pounds of gold disappeared back into thin air. Books balanced.

Everyone in the studio had the same memory: five minutes ago a police-escorted black limousine screeched to a halt out front, and this man, familiar face lined and pale with shock, stormed in with a covey of Secret Service men and commandeered the studio.

Braxn filled out his face and body with paunch. The man who owned this face died painlessly as soon as Braxn had assimilated the contents of his brain. The body disappeared. His family and associates "remembered" that he was in New York for the week.

A finger of thought pushed into another man's heart and stopped it. Convincing—he was overworked and overweight, anyhow. But to be on the safe side, Braxn adjusted his catabolism to make it look as if he had died ten minutes earlier. He manufactured appropriate cover stories.

All this accomplished, Braxn let time resume its original rate of flow.

The light winked green.

A voice offstage said, "Ladies and gentlemen—" what else could one say?—"the, uh, Vice President of the United States."

Braxn assumed a tragic and weary countenance.

"It is my sad duty to inform the nation . . ."

NINE PHASES in the development of a G'drellian from adolescence to voluntary termination.

The first phase is aesthetic, appreciation of an art alien to any human, save perhaps a de Sade or a Hitler.

The second phase is power.

DARKSIDE CROSSING

By James Blish

James Blish writes ambitious science fiction on moral themes. In DARKSIDE CROSSING he presents a man's struggle to lose himself in the dark void of space. But for this "man who has everything" there is no escape. In this finely wrought chronicle the reader can feel the presence of the infinite, which allows—and renders meaningless—the petty aspirations of men.

I

FEELING OLD and diffident he propped himself naked on one elbow and looked down at Eleanor in the indirect halflight shed from the amber sides of the reading lamp fastened insecurely to the headboard. It was to be, in effect, his last such look, but he felt neither more nor less detached than ever.

Asleep, and with almost all of her makeup kissed off, she still did not look her age, which (her dossier assured him) was forty; but she would no longer pass for the thirty-two she claimed even (though she knew better) to him. Certainly she did not need the defense that somewhere for every woman there is a man, or two—let alone that there is no woman whom most men will not take to bed at least once. No, she was pretty; too blond to be real, too old to be high-breasted, too worn to be worshipped and so on—but pretty, very pretty. Insofar as he could tell (he had never been much of a sensualist), she was sexually both responsive and expert.

Furthermore, she had good taste and was moderately intelligent and she would have been a credit to him (had he ever given a damn about social credit).

But he did not give a damn about how he looked to anybody. He had seen himself in newspaper photographs often enough to realize that a remarkably short, slim man with whitening red hair and fading bushy red eyebrows has nothing to be vain about. Had he not been rich, the newspapers and the television cameramen would have passed him over like a stray cat.

He got up quietly and went to the bathroom, where he looked at himself in the long mirror on the back of the door. Cheekbones; ribs; pot; shanks; scars; broken toes; no, nothing to recommend him but money. This was no news. And even more certainly, Eleanor was hardly a mistress anybody else would have taken had he been not only the world's, but the world's history's richest man. She was neither a Kennedy nor a Gabor—had probably never even heard of their legends; no family; no power; no symbol of wealth, sex or anything else—except, perhaps, that John Hillary Dane was hardly in any way like any other billionnaire in history.

Poor child. Born in Vienna, she had at sixteen married an Alsatian named Max (who?), a stranded Wehrmacht lance-corporal about whom even Dane's intelligence department had been able to find nothing further. At seventeen she had deserted him to try the Hamburg cabaret circuit—about those years Dane had never asked anybody—where an American naval lieutenant from a good Virginia family (totally investigated; totally uninteresting) had fallen avidly in love with her and had sponsored her immigration, through his Richmond connections, to the States.

The kid had meant to marry her but he never saw her again, though for years thereafter he could have found her—had he known how—in any model directory. Dane himself had picked her from a photograph in a sleazy, only semi-legal magazine called *The Private Swinger*, which specialized (among more gruesome spe-

cialties, such as whips and chains) in free listings of women for whom "model" was only the most mailable and the most instantly dispensable euphemism. As far as Dane could be sure, he had been drawn to the photograph only because the nearly nude woman in it looked blurrily pretty, unlikely to want marriage if otherwise provided for, and seemed nothing like his wife.

It worked out fairly well until this pretty but hardened piece of goods had—quite undemandingly—fallen in love, perhaps for the first time in her life and, worst of all, with Dane. At least she said so, and he had no special reason to doubt her. Though he had never felt any real love for anything, he had been through several episodes of that strange cardiac-respiratory madness (once with Jennet) he would have called infatuation, remembered how painful, unwelcome and distracting it had been, and was convinced that Eleanor really did have the disease—and never mind the money.

HE SIGHED, closed the bathroom door just far enough to leave a little light in the room and got back into the bed. Obscurely, he was touched, or at least he thought he was. He did not think he was moved. Eleanor was silky and he was full of remote affection for her, but she was not what he had been looking for in the world. Nothing was. He was as yet unconvinced that what he wanted even existed. If it did, he would not know how to recognize it. He could not even put a name to it. Poor child.

She stirred foggily—somehow, even in the deepest, most satisfied sleep, she sensed when he was watching her—and blinked up at him.

"What?" she said.

"I didn't say anything."

"No—but you were thinking."

"The ultimate crime?"

"You know what I mean, John."

Since he did know he did not answer. It was odd, and a little piquant, to hear this *ewig-Weibliche* cliché in her still faintly Viennese accent, as though nothing and nobody had changed since the creation of the Garden. But then, he had had a much better chance to obliterate his own, more outré accent than she had had, and a good deal more incentive, too; for a model/courtesan in America, a slight accent is an article of trade; for a rising young executive, not. The day after his first boss in the United States had described him—with admiration, as he had realized too late—as "a genuine All-Latvian Boy," he had set out to teach himself phonetic, Webster IId International dictionary English; and then had discovered that nobody spoke it. Worse, most Americans mistook it for a phony British accent, or what the British called "Mid-Atlantic," neither one thing nor the other. Now it was too late to revert to his boyhood New Jerseyan, or teach himself Webster IIId—and besides, very soon now, he would be talking only to himself.

She slid upright on the bed, unsuccessfully pulling hair back over her freckled shoulders, and folded her forearms on her knees above the sheet, her breasts depending heavily and somewhat pathetically between her upper arms. Resting her chin on her crossed wrists, she spoke quietly.

"Is this it?"

"Yes."

As always, he did not exactly care; and yet she looked so blowsy and so forlorn in her expensive setting that he felt a paradoxical and quite unexpected tenderness.

He added: "I'm sorry."

"Oh, I knew it was coming. Luck always changes and 'I'm sorry' is no help. If one can say, 'I loved it while it lasted,' one has all one can reasonably ask for."

The particular mixture, again, of European fatalism and American cliché. And, of course, of the rituals of what the books called love. Should he feel guilty? He did not know.

"I loved it while it lasted."

"Perhaps. I know you tried. It's the only part of life I know where trying is the surest way to fail—but never mind."

"It wasn't that," Dane said. "The problem is, I've got to go on a trip—a long one."

"You can't tell me where, I suppose."

"I could—but it wouldn't mean anything to you. Hardly more than a dozen people in the world have ever heard of it."

Her carefully bleached and shaped eyebrows rose. "I didn't think there could be such a place any more. It must be very small."

"It may well be," Dane said guardedly. "But that's not important. The main thing is, I'm not coming back. Nor am I telling anybody but you that I'm going. I'm just going to vanish."

"Oho. A Shangri-La."

He smiled.

"Something like that. I can't be sure. But once I'm gone a lot of people will be looking for me—and one of them is bound to happen on you, sooner or later."

"I know about your private detectives," she said tranquilly. "But I know how to keep secrets, too, and you know I know. I will keep this one."

"Thank you."

"I hate men who thank me. It makes them seem so abject, as if I'd demeaned myself by taking them on. A proper man ought to take a woman by right, without any doubts of himself."

"I'm sorry."

"There, you see?" she said, lifting her hands and breasts to God. "Somehow that's the kind I always get—either terribly grateful, or terribly apologetic."

"You're very philosophical. I have to be grateful for that."

"I'm furious," she said, weeping abruptly but with open eyes, "and I love you. At least, in God's name, before you go, show me a little honest lust."

ORDINARILY, WHEN an observatory discovers a new celestial object its first act is to telegraph the particulars to Harvard University, the world's astronomical information clearinghouse. Harvard then prints an announcement, which it mails as a postcard to subscribing observatories. In due course the discovery is confirmed or it is not; if it is, the discoverers write it up in detail, and submit it as a letter to *Science* or *Nature*, both of which are weeklies. If the discovery is of sufficient importance in the editors' eyes, this entire *cursus honoram* need take no longer than two months, despite the world-wide glut of scientific publication.

The Dane Observatory discovery was of sufficient importance, but the station in the crater of Coropuna was no ordinary observatory. It was the only one in the world which was not wholly owned by a university or consortium of universities, a foundation or a government, but by one single man. And Dane had issued orders that nothing it found was to be communicated by anybody until he had seen it first. The staff protested, mildly, but secrecy was one of Dane's major ways of making money—and of keeping himself to himself, though under that rubric he called it privacy.

He insisted.

It was perhaps a sign of the times, he reflected, that none of his astronomers chose to resign rather than work under these conditions. The rule was wholly alien to what was supposed to have been the tradition of freedom of information in science; but the tradition had been systematically traduced by the security regimens which had begun to proliferate in the West about 1940, and in the East long before that. By as early as 1970, every major country in the world had its own equivalent of an Official Secrets Act, and nearly every scientist had become resigned to it.

Dane's private counterpart of such an Act was by now only a minor cloud in the general climate, which was one of steadily thickening fog—being steadily fur-

ther thickened by the spying devices he had either made possible or which his own company produced.

But in view of the discovery itself, his ruling was providential as far as his own interests and drives were concerned. Briefly, Dr. H. Kardon Uscott, his chief of staff at Coropuna, had found that the Sun is a double star.

The Sun's companion, Uscott reported, is a white dwarf star, of about the same size and intrinsic brightness as Proxima Centauri—which had previously been supposed to be the nearest of all other stars to the Sun. But the Alpha Centauri twins are four light-years away from the solar system. The Sun's companion was only twelve thousand times as far from the Sun as the Earth is—a meaninglessly long distance in miles but only about one sixth of a light-year, which is minuscule as interstellar distances run.

The two mismatched stars revolve around a common pair of epicenters in an ellipse, one circuit of which takes 1,300,000 years, so that the proper motion of the dwarf companion against the background of "fixed" stars is only one second of arc per year. Had it been in northern skies, even this would have been spotted by blink-microscope comparison of sky atlases reaching all the way back to the Astrographic Catalogue started in 1887 by no less than eighteen universities—regardless of the fact that there are more than nine hundred other stars in Earth's skies which are brighter, every one of them much farther away. But instead, it stood in the sky almost directly above the South Pole, effectively invisible, unmapped, even its proper motion disguised by the precessing of the equinoxes. Until Dane Observatory had become functional it had never even been photographed, let alone suspected to be a companion of the Sun.

Dane's star had risen—and not in the East, but in the ultimate austreal cold.

He was instantly gripped by a desire to see it, but business held him back for more than a year, while his

astronomers fretted. Nevertheless, he read the data closely as they were transmitted to him by teletype: mass, 0.07 Sun—brightness, 0.000079 Sun—maximum eccentricity, 0.07—maximum separation from Sun, 13,300 A. U. While he was about it, he checked some other nearby stars—whenever possible under their Roman, Arabic or even Chinese proper names, so that tracing the nature of his interest would be difficult even through a computer. Nan men (Alpha Centauri), Zuarah (Gamma Eridani), and Eta Cassiopeiae were all Sun-like stars and all quite nearby, but they were also members of multiple-star systems, which seemed to rule out planets. For a while he was captured by a single star, about eight percent brighter than the Sun and identified as Delta Pavonis. But he lost interest in it on finding that it is nineteen light-years away; the computer had more grandiose ideas than he did of what could be meant by "nearby."

When at last he was able to fly down to Coropuna, Dr. Uscott was almost at the bursting point.

"I can't begin to tell you how important this is," Uscott said, leading the way along the bitterly chill floor of the faintly echoing dome toward the telescope. The poor man's teeth were chattering like a squirrel's under his breathing mask, obviously as much from excitement as from cold. "Just to begin with, the f-finding that one member of a close double can have a big family of planets throws every existing theory of how solar systems are formed into the discard. Though Beta Solis, as we call it, does also explain the aberrations in the orbit of Neptune, as the discovery of Pluto never did. But there's still more."

They got into the lift which would take them to the telescope's Newtonian focus, where there was a heated and pressurized viewing chamber (the Cassegranian focus could not be heated, since it was directly under the big mirror, which heat would warp).

"What more?" Dane said.

"This dwarf star has at least one planet. Apparently about the size of Jupiter. The implications—"

Suddenly Dane thought he knew how Toby Walker had felt in the electric chair atop the tower in Denver.

"A planet!" he said tensely. "Will I be able to see it?"

"Oh, no. It's far too faint, though with electronic amplification we might barely be able to get an image or a track of it. We only deduced it from a p-permutation, a wobble in the companion star's own orbital track. But Mr. Dane, the implications—"

"You have no idea," Dane said into his mask, "what the implications are. Show me this star."

II

HE LOOKED at it long and hard, though it was very far from being impressive: a tiny, blue-white spot of light, spiky with the distortions caused by the four supporting members of the telescope's prism, fuzzy with aberration, dancing slightly in the viewing field—seeing was a problem even this high up in the air. No planet was visible, as Uscott had predicted; nor did any appear in the photographs Dane was subsequently shown in the observatory office. But there was Dane's star—close, ambiguous, somehow frightening, and yet somehow also infinitely promising. "You're sure about this planet, Uscott?"

"Absolutely, Mr. Dane. We've detected others far more distant, by the same method. The eccentricity—"

"Could there be others?"

"Well, now, there we have a problem. All our cosmological theories have gone out the window as of last year. It's *impossible* for this star to have *any* planets, even a single gas giant. But there it is. (For that matter, in this light, our Sun shouldn't have any planets, either). So—yes, provisionally, there could well be others. We need a lot more research and, even more, we

need a lot of theoretical help. When can we send out the announcement?"

That star—Beta Solis—had cost Dane more than forty million dollars; not very expensive as modern real estate values went, but on the other hand . . .

He stacked the photographs and handed them back.

"Never," he said.

DANE COULD not have said exactly when he had decided to go to the star. It seemed to him that he simply and inevitably assumed that he was going from the moment that Uscott had told him the star might have other planets besides the gas giant; but the decision might lie buried even earlier.

He knew something of the obstacles to the ordinary notion of interstellar flight, in part from his own training, in part from his recent checks with the computer. Limited to a slow build-up to near-light speed and an equally slow deceleration as the target was approached, such a trip across even the four light-years to the Alpha Centauri system (Nan men, Hadar, Proxima) would take the better part of a lifetime. Moreover, the energy requirements would be prodigious; the mass ratio of propellant to ship would be somewhere in the neighborhood of a billion to one for any reasonably speedy crossing. Technologically, the thing was impossible now and probably would be for—to be optimistic—a century to come.

But crossing only a sixth of a light-year—two light-months—was another matter, especially if one viewed it as a one-way trip. A little scribbling (for now he wanted to leave no further clues even with the lowliest computer programer or in the machine itself) showed him that it was in principle within reach now.

Suppose, for example, one were to build a fusion-drive ship almost exactly like the *Indefeasible*, the one that had set out for the Saturnian satellite, Titan, in 2002. The design would involve only two essential differences: first, its life-support systems would be total-

ly devoted to one man, not five; and second, all the space and mass saved by this would be given over to propellants.

The *Indefeasible* had reached Saturn's orbit in nine months, decelerating most of the way under solar drag. The same ship under a continuous two gravities of acceleration—which would be no harder on the passenger than living in one of the Dane Tower's express elevators—would pass the aphelion of the orbit of Pluto a little sooner and, in fact, a crossing to the dwarf companion in such a vessel would probably take no more than three years of subjective time, thanks to the Lorenz-Fitzgerald effect. (Of course it would take longer in objective time, but Dane did not plan to come back.)

THE SCHEME had many beauties. To begin with, no Research-and-Development expense would be required; the *Indefeasible*, now on its way back from the Saturnian system, was no longer a pioneering machine, but a collection of hardware down to its last circuit and compoent, and Dane could put his hands on all its specs without exerting himself overmuch. He did not have to invent it. He could then sub-contract each component, breaking the manufacture of the ship into so many tiny parts that no single sub-contractor would have the faintest idea of what the part he was making was going to be used in—thanks to the phenomenon called technological fallout, spaceship components were constantly turning up in civilian applications anyhow. Even gross parts like hull plates could be scattered among a multitude of aircraft, submarine and boiler works all over the world, and none of them Dane subsidiaries. It wouldn't even have to be done on a cost-plus accounting system, since no profit was contemplated anyhow.

Fine; nobody would recognize the bits and pieces for what they were. But how could you conceal the assembling of them, let alone the completed object? Clearly the ship would have to be assembled in orbit, not on

Earth, which willy-nilly would make it the most conspicuous human artifact since the Seven Wonders of the Ancient World with the Dane Tower piled on top of them.

Conceivably it *could* be assembled on the ground on the Moon, in some unnamed and uninteresting crater on the far side. No, scratch that—the take-off from the Moon would leave a high level of risidual radioactivity which would arouse intensive investigation within only a few years. Also, assembly under even lunar gravity, while not outright impossible, would be too expensive.

Well, several dozen communications and weather satellites were in synchronous or "parking" orbits around the Earth, just far enough out—22,300 miles—so they made one revolution every twenty-four hours, thus remaining permanently above the same spot on the ground. Why not assemble his own ship in a twenty-eight day orbit behind the Moon? There were no bases back there; in fact, there were only three on the near side: two American, one Soviet. Any of them, if by any chance it picked up the passage of the vessels containing Dane's parts and crew, would be likely to assume that the unscheduled flight belonged to the other nation. (Better have a Russian-speaker always aboard, to respond if hailed by one of the U.S. bases.) Another plus!

Next came the problem of a staging area on Earth. Another extinct volcano in the Cordillera Occidental was the obvious answer—everyone was already used to his shipping vast quantities of materials down there—and as for the take-offs, well, obviously the observatory staff would have to be in on all this, and who else would see them?

Indeed, now that he came to think of it, the only part of this operation that threatened to be uncontrollably conspicuous was the money. The cost, he was sure from the experience of the *Indefeasible*, would be almost a billion dollars; to raise that he would have to liquidate about a third of his assets and that would be

news—the *Wall Street Journal* and the *London Sunday Times Business News* would alike front-page it.

But he had another convenient cover: He could reinvest the money in Dane Laboratories, the corporation—ostensibly interested in ethical drug research, with emphasis on longevity—he had set up to disburse the monies for his time-viewing project. That project he would keep going, dead end though he now knew it to be. If the pharmaceutical front were ever penetrated, the revelation of the Future experiments would be sensational and would make a marvelous false pointer to which direction he had vanished in. And he could probably make use of many of the people on the Future project staff, which would cut down on one fraction of the expense—they had *already* been bribed. So, by great good luck, had Toby Walker, the only reporter in the world of whom Dane was actively afraid.

A note: Could that vast, perfect computer he had unsuccessfully tried to have Toby sabotage be copied *in petto* for the starship? If so, it would save a lot of space and weight; and just the attempt to do so—though not for this purpose—was already a matter of record as the chief interest of the Future project.

HE SHOULD, he thought, give some consideration to the future of the firm, because it represented the future of his family. Little enough though he cared now about Jenny and Hank—let alone Jennet—he had loved them once and they were his responsibility, as, for that matter, were the livelihoods of Dane employees. (There were no stockholders; he had bought them out early in the game and neither the parent holding company nor any of its subsidiaries had ever gone public, a situation on which the Department of Justice had made three lengthy, expensive and utterly futile court assaults.)

It would be best to handle this by testament. He already had a reliable general manager, who could be depended upon to keep things going—though not to keep them growing—after Dane's disappearance. In a

will he could give exactly half of everything to each of the children—apart from a trust fund for Jennet. It would take ten years for him to be declared legally dead; if in that time the kids had grown up enough to take an interest in the firm, all well and good; if not, the exact fifty-fifty split would prevent them from imposing arbitrary policies upon the manager, since they were at loggerheads about everything almost all of the time. (Hence also the trust fund for Jennet; if he split control into three parts, any damn fool notion, without limit, would command a majority.) They would be protected from another antidiversification suit by the government by the massive liquidation of a third of his companies.

It would be wise, he supposed, to try to determine whether or not the dwarf companion had any other planets besides the gas giant—let alone one on which he could live. Of the nine possessed by the Sun and their twenty-three-odd satellites, only one supported life above the bacterial level at all—and the chances that a white dwarf would have a viable world were much smaller.

On the other hand, Uscott had said that there was suddenly no longer any theoretical base or model for planet formation, thanks to their own discovery of Beta Solis. Dane had the distinct impression that if Uscott were to find the dwarf companion to be surrounded by ice cubes, or even fairies, he would be more resigned than surprised. In any event it seemed unlikely that the question could be answered by evidence from Dane Observatory alone, and Dane had no intention of letting Uscott ring in any other observers. He would take the chance; if there was no planet for him when he got there, well, he would at least be shut off the Earth, which he himself had helped to spoil.

Now, about a trust fund for Eleanor. . . .

Clearly, the details were going to be knotty, but that was why he employed experts. The first principles all appeared to be sound.

Indeed, he was a little awed at the way all his interests, without any foreplanning on his part, seemed to fit into—and to have been pointing toward—the flight to the dwarf companion. Some familiarity with the sacred literatures of the world might have acquainted him with his predecessors and his prophets, but his early interest in poetry had not lasted long enough; he was now only an engineer and entrepreneur. He was yet to realize that for a god nothing can go wrong in the youth of his power; even his errors are fruitful or can be corrected by deluge of rain, blood, locusts or money.

MONEY IS time. By spending somewhat more than the minimal billion dollars Dane got the ship—which, peculiarly, he called the *Tranchemer*, though to nobody but himself—built in a year. The computer project worked out in half that time, so he was able to give himself six months of intensive flight training in a mock-up of the *Tranchemer*'s life-support and control chambers which had been constructed on one of the many empty levels of the Dane Tower. He was even once able to visit the secondary staging area in a far-side lunar crater some sportive interpreter of the earliest Orbiter photographs had named Alfred E. Neumann (and indeed there is a distinct resemblance); and from there, to go through the then-skeletal *Tranchemer* herself. This was his first trip into space and he found he enjoyed it hugely.

Nothing, absolutely nothing, went wrong. How could it?

It then became time to assemble the family, which did prove difficult. Jennet was of course no problem—she was always compulsively, obstreperously, naggingly, *there*. But Hank had become the leader of some sort of noise-making group which called itself Sufi Mahound And The Black Goyim; and though despite its strainedly outré name it sounded like every other such group to the nineteenth decibel place and it had proven popular enough to be almost constantly on tour. As for Jenny,

she was not hard to locate, since she had settled down to reading what she called "half-Haiku" to another sort of semi-music in coffee-shops in the East Village; but persuading her to attend the meeting was more work that pinning down Hank's itinerary.

When at last Dane did manage to bring them all together they were strangers. Hank, always long and thin, now looked like someone preparing to model as a hairy ghost. Even Jenny looked rather gaunt, though as a teenager she had been on the plump side—but at least she was clean. She had inherited her father's red hair, which she wore very long. Hank's, which was dark brown, was almost equally long and kept getting mixed up with the *crux ansata* which he wore on a neck chain over his buckskin jacket; every so often he would get hair out of his eyes with a toss of the head which in Dane's own youth had been the gesture with which young men said, "I never wear a hat—" as though not wearing a hat were a point of honor.

But they no longer aroused in Dane any emotion but faint distaste. Against the background of the overstuffed and fussy drawing room—Jennet had Edwardian tastes —they seemed like nothing but waifs. Well, it was their own choice.

Dane wasted no time on preliminaries.

"I wouldn't have bothered any of you for something trivial," he said. "The fact is, I'm leaving the business and the country—permanently. You are all provided for; Horowitz and Horowitz are sending you letters giving you the details. There are a number of people who know where I'm going, but you would find it very difficult to figure out who they are—and impossible to get them to talk even if you did identify them."

"Why should we try?" Hank said. "If you've provided for us, where you go is your own business."

"Precisely."

"Well, I for one shall certainly try," Jennet said grimly. "I didn't marry to be provided for and, in fact, your damn businesses have been nothing but a burden to

me. And I *certainly* didn't marry to be deserted. When I think—"

"You have no choice in the matter. As for trying, it would be fruitless, because I have so arranged matters that it would be physically impossible for you to follow me, even if by some miracle you did figure out where I'd gone."

"You make it sound like you're going on the next trip to Saturn," Jenny said scornfully.

"You might just as well assume that I'm going time-traveling for all it will do you. And Jennet, for your own good, I strongly advise you *not* to try."

"A threat, now?"

"Not at all. When you get the letter from the lawyers, you'll see that it's to your advantage to have me declared legally dead in the minimum possible time. Don't cloud your case by searching for me or otherwise flailing about as if you thought me still alive. To do so would be not only useless but stupid."

"And you expect me to take your word for this?"

"No, not really," Dane said. "But it is my best advice and I'm obligated to offer it. Making the horse drink is up to God, not me."

"I don't think you can tell the difference any more," Jennet said in a voice of rusty iron. "Your notion that you can get away with this sounds suspiciously godlike to me. You've had so much power for so long you think it's infinite now. And you are going to look marvelously silly when I find you bedded down with some starlet in Peru."

Dane grinned. "Ah, you've ferreted out my secret already. Well, I wish you joy of it. But you'd better tell Sam Horowitz before you tell the press. You may find his reasoning more plausible than mine—or anyhow, less suspect."

"Hey Dad, is that really all there is to it?" Hank said, with visible disappointment. Dane was momentarily startled by the *Dad*, until he realized that it was a standard term of address in Hank's present circles.

"Sorry, Hank, but I'm answering no questions and dropping no clues," he said. "Assume anything you like. Even an accurate guess wouldn't change anything in the slightest."

"—God said," Jennet added.

The meeting, inevitably, went on for quite a while longer, and became increasingly more painful; but at this point, since Jennet had inadvertently had the last word, the Recording Angel switched off his tape.

Now, to say goodbye to Eleanor.

III

MASKED BY the Moon and by the inherent invisibility of rocket exhaust in space, the *Tranchemer* began to move under its own power. In his control couch, John Hillary Dane could hear nothing but a vague whisper, transmitted along the hull—the noise of the engines, as well as the torrent of hard radiation they produced, were separated from the life-support sphere by more than a mile of storage modules, most of them airless until he should need to enter them—but he could feel the thrust mounting, all right.

It was welcome; he had spent the last frantic ten days of preparation in free fall, except for brief workouts in the centrifuge chamber. His designers had considered locating the entire life-support capsule along the rim of a centrifuge, as the designers of the *Indefeasible* had done; but the crew of the Saturnian expedition had reported that the nausea produced by moving about under the Coriolis forces involved had been so much worse than the effects of free fall itself that they had kept the centrifuge shut off for most of every ship's day. Dane would just have to get used to free fall, for he was going to spend a substantial part of three years in it, with only enough time in the small centrifuge to maintain his skeletal muscle tone and to prevent calcium from being leached out of his bones. At the moment, though, the return of the equivalent of gravity—

even though it did make him feel as though he were lying on his back—was a pleasure.

Solemnly elated, he touched a pre-programed trigger on the computer console. Immediately in his foam-padded earphones the whisper of the engines took on tonality; it was joined by a high violin tremolo on E flat, and then by a distant horn call in rising and falling fourths—the opening of the Fourth Symphony of Anton Bruckner, suitably subtitled *The Romantic*. Within a few minutes, Herr Bruckner was making so much noise that the engines were swamped out entirely.

The thrust, however, grew much faster; long before Herr Bruckner had gotten to his second theme (though since his first themes tend to come as groups of three, his seconds do not show up in any hurry), it had reached the prescribed one gravity—which was even a little unpleasant after ten days of no gravity at all. But it would not last long. He had discovered early on that his snap estimate of the acceleration he would need, and its duration, had been fantastically too high—which was lucky, for had his original guess been correct, no ship conceivable in the present state of the art could have been built to deliver it. What was achievable was an average relative velocity of 9,455 miles per second, which at one gravity of acceleration would cost the *Tranchemer* three hours, thirty-four minutes and twenty-five and a fraction seconds of thrust.

Needless to say, Dane was not planning to travel at anything like that clip inside the dusty, littered solar system—or expend the energy needed to attain it, either, this close to the only home of Man. Instead he planned to run the engines at one gravity inside the solar system for only one hour, thirty-five minutes and eight seconds, and even there only in short bursts. The rest of the requisite velocity—which meant almost all of it—would have to be picked up later, when the *Tranchemer* was far beyond both the environment of Man and the possibility of detection.

From several points of view, of which comfort was

the least important, it would have been better to have left the Moon under nine gravities and put in correspondingly more coasting time later. The present trajectory would take the *Tranchemer* once across the near side of the Moon, a crossing during which she was sure to be spotted by radar by one of the bases and perhaps even visually as well. But that couldn't be helped; Dane could only hope that the transit would be written down as a story of saucer sighting. The synchronous orbit in which his ship had been built was necessarily in the plane of the ecliptic; whereas she would eventually have to be traveling at ninety degrees to that plane, and her mass was so great—and her distribution of it so barbell-like—that she could not be wrenched into the new direction in a hurry without snapping somewhere along the bar.

As Herr Bruckner reached his third theme, his usual and here again uniquely appropriate binary one, the Earth appeared over the limb of the Moon, a vivid blue globe about the size of a pea held at arm's length. It would soon become much larger, for the synchronous orbit actually passed closer to the Earth than it ever did to the Moon and the *Tranchemer* was widening its distance from the Moon every second now. That was perhaps a protection; at that distance the ship would be difficult to spot by accident from either the Earth or the Moon.

The Earth duly grew. By the time Herr Bruckner, a notoriously long-winded composer, had gotten to the absolute end of his symphony, Earth was a stupendous and beautiful sight. The computer, as instructed, gave Dane five minutes of silence (except for the engines) to contemplate it and then began to pour into the earphones something even more long-winded, the Second Symphony (subtitled *The Resurrection*) of Gustav Mahler. Herr Mahler was also much noisier; if any challenges were coming in—or any parting words from Dane's associates—neither Mahler nor the computer would let them through.

The swelling of the Earth would have given Dane the illusion that he was on his way home, had he considered the Earth home any longer. He did not. He watched the beauty expand with an abstracted mind. In due course the symphony came to an end in a tumult of orchestra, organ, chorus and bells, and by then Earth was receding and Dane had his heavy back to it.

No more music now. Unlocking his chair from the floor, Dane drove it along its tracks to the food output of the console, which extruded at him tournedos Rossini, a baked potato with sour cream and chives, artichoke hearts, a garlicky tossed salad, an athelbrose bombe and a fast-dripping pot of espresso, all oriented to the thrust of the engines—his farewell dinner and one of a kind he would see no more than six times a year henceforth. As he tackled it, the computer began to read to him something he had always meant to read himself but had never had the time to, what with business and keeping up with the technical literature (the computer's library consisted almost seventy-five percent of such works):

Jemand musste Josef K. verleumdet haben, denn ohne dass er etwas Böses getan hätte, wurde er eines Morgens verhaftet . . .

He fell easily in with the language, in which he had always been fluent. The Earth of its origin fell increasingly away and by the second chapter he found that he was not thinking about the Earth any more—or anyhow, not so often.

LIKE MOST laymen, when Dane had thought about the solar system at all he had thought of it in terms of those spurious "maps" which are printed in popular magazines, showing the orbits of the planets as a series of close concentric circles, with the planets themselves neatly arranged outward from the Sun in a straight line. The reality, even though he was looking down on it, was very different: a sea of stars in which the planets were only other sparks, lost in vastness and impossible

to identify without the aid of the computer, and those beyond Saturn not visible to the naked eye at all. He had learned to expect this but after a lifetime of unconscious acceptance of the usual simplistic schematic, it was nevertheless disorienting.

By a large coincidence the *Tranchemer*'s great arc away from the system did not become sharply inflected away from the ecliptic until it passed the orbit of Saturn, and the planet was nearby at the time—near enough, at least, so that the ship's image amplifier was able to bring in a spectacular view. Dane studied it for several hours as it, too, dwindled. It affected him in a way he would have found hard to describe. The Earth, to be sure, was beautiful from space—and had a special beauty as an oasis of life—but Uscott had said that there were probably many other such in the galaxy, and indeed Dane was staking his life on there being another a good deal less than a lifetime away. But *this* great, frozen, poisonous storm of a planet, colored in a thousand shades of straw and surrounded by gossamer rings of broken ice and dust, might well be unique. Leaving it behind was somehow more forceful a symbol of his abandonment of his home system than leaving the Earth had been.

In its honor he had the computer play him the Saturn movement from Holst's *The Planets*; but in the face of the real glory of the real globe the music seemed so cheap that he ordered the crystal wiped. This was unfair to Holst, who had never intended to depict any actual planet—his suite was instead a sort of requiem for astrology—and Dane instantly regretted his action—but the thing was irrevocably done. He would have to learn to be less impulsive, or such flashes of irritation might expunge his entire library before the trip was done. He called for the *Missa Solemnis* next, and to this great requiem, which nothing could cheapen, the ringed giant passed out of his ken except as another spark, which in turn had faded away . . .

Odd other crochets cropped up. He had always

thought of himself as a solitary type despite his record as an executive *non pareil*—as, in fact, a sort of latent introvert; one of the minor attractions of the voyage had been the prospect of absolute solitude, of absolute freedom from all obligations and interruptions, even the maddening and ubiquitous telephone. By the time he had left Saturn behind, however, he found that he was talking to himself a good deal. Oh, the computer could talk but its responses were stereotyped; it always gave the same reply to the same proposition; it could speak but not conduct a conversation, unless one wanted to argue logic with it, a pastime for which Dane was not well equipped by training. His monologues at least sometimes had the virtue of surprise.

SOME DISTRACTION was provided by the return of gravity, for with the solar system now spread out behind him, he was still only making slightly better than 171 miles per second—a tremendous space compared to any interplanetary velocity ever achieved before, but still nowhere near what he needed for the major crossing. But this time there was no reason to apply the acceleration in short bursts, since all the necessary course corrections had now been made; the remaining velocity could all be piled on at once, and that was what the computer was programed to do. After one hour, fifty-nine minutes and eighteen seconds, the engines shut off again and he was back in free fall and the contemplation of his own state of mind. He would not get any diversion from that source again for the next thirty months.

Nevertheless, the sudden marked change in his environment, brief though it had been, helped him to get back to something resembling his normal frame of mind. Then, about six weeks later, just as he was congratulating himself upon having come to terms with his sentence and even beginning to resume enjoying it, he had a shock that he had utterly failed to anticipate. By this time he was more than forty astronomical units

from the Sun—more than the mean distance of Pluto, though in a quite different direction. In complacent celebration, he looked back at the solar system for a last time—

—and found that he had lost the Sun.

Of course, the computer could find it for him. At this distance it should be the brightest star in the sky, almost like a distant but still intolerable arc-light; and from this angle it was being sought among the thinning stars toward the edge of the galaxy, since the *Trachemer* was going approximately in the direction of the galaxy's center. In fact, once the computer had located it, the image amplifier probably could still make a recognizable disc of it.

But to the uninstructed, naked eye it was gone and that was what counted. The lone star that had spawned Man's home was now only a bright dot among thousands of other dots; no longer Zarathustra's and Mithra's great object of worship, but only a grain of incandescent sand on a remote, permanently dusky beach.

Dane was expatriate, as no man had ever been before—nor would he ever see that Sun again.

No such conscious chain of thought about the matter passed through his mind, however, until much later. Upon the discovery itself he was abruptly in the grip of an acute panic. His knees turned to jelly, his fingertips and lips tingled, his soul was filled with dread and he was fearfully dizzy—no, not dizzy, for the cabin did not seem to be swimming—but overwhelmingly he needed to lie *down*. Clumsily—for he had lost almost all control of his body—he swam into the womb of the centrifuge and to the hammock; and there he passed out, almost before he could hit the starting switch.

HE AWOKE feeling absolutely normal, except that he could not remember who he was, where he was, or the names of most of the things around him; nor did this produce in him any emotion greater than a mild curios-

ity. Only a long-established reflex prevented him from killing himself by trying to leave the centrifuge before turning it off.

He floated into the control chamber as compulsively and as mindlessly as a sperm going home. He was startled, finally, when the computer spoke to him—though all it said was, "Menu?"—despite the fact that he could think of no good reason why a room should not talk. The startlement got him started asking questions.

The computer was both a good and a bad interlocutor. It could inform but it could not lead; certainly it was not programed for psychotherapy. As a result, after several days Dane had most of the facts, both major and minor, back in his head, but he could not be said to be in possession of them. They had no rank order, no importance, no relevance to the creature he had become. And the computer knew nothing at all about all that part of his past which therapists call "formative."

This fugue and amnesia, he later figured out, lasted nearly six months and was perhaps a lucky episode in a way, for relearning even simple facts kept him as preoccupied and happy as a child who has just discovered that there are more than fifty Oz books, for almost the whole period. Coming out of it into the real universe was painful and he was never sure again that he quite completed the journey. His only test for the firmness of his grasp upon anything was how painful it was, which in the human condition is perhaps the best test, but he remembered dimly that there had also been such a thing as joy, of which he never recovered anything more than the word itself.

Some other changes also became evident. As Eleanor probably had known—or would have agreed, had the thought been new to her—Dane had never been much of a sensualist, but he had cold-bloodedly provided for his inevitable needs with a library of pornographic films (on hot tapes or crystals—the definition would have

been too poor) which he had planned to use sparingly, whenever the problem could no longer be ignored. He had even allowed for the law of diminishing returns by having the films graded by two experts, one of whom had been his own personal clinical psychologist. He found now that even the most orgiastic of these had no effect on him . . . and what was perhaps worse—though this was only a guess on his part—neither did the mildest, in which the "consorts" showed some tenderness toward each other in addition to the meaty coils of their "relationship."

He was, he concluded tentatively, no longer quite human. The conclusion was tentative because he no longer remembered whether or not he ever had been.

At the end of the first year the apparent magnitude of the dwarf companion was +2. It did not occur to him to ask the computer the apparent magnitude of the Sun.

By the end of the second year the computer was able to report that the dwarf companion had at least five planets—another blow to the chops for the cosmogonists. Three of these were gas giants, one of them—the one whose existence Uscott and his crew had deduced—now plainly separated from the companion's glare in the amplifier image. It had thirteen satellites, all of them dead losses. The other two were dense inner planets but could be called Earthlike only by the most rarefied of theorists: one was too far away from its primary to be warm enough for liquid water, and the other was ten thousand miles in diameter and returned a spectrum with only one absorption line—carbon dioxide.

Dane was not dismayed. He was rediscovering Mozart and had just gotten up to *K. 361*. None of this music seemed to have any emotional content—though, judging by the rest of his library the man he had once been must have thought it did—but the technical perfection of even the small works, e.g., the piano pieces for four hands, was staggering.

Six months later Dane had found his planet and three months after that, the *Tranchemer* swapped ends and began to prepare an orbit around it. No wonder it hadn't been visible before; it was less than six thousand miles in diameter and only forty million miles from its feeble, collapsing star. But it would do; it would do very nicely.

Only mildly elated, the creature which had been John Hillary Dane in some past broke out of storage the dove-shaped child of the *Tranchemer* which would be his landing craft and began to prepare his epiphany. In his earphones, from the earth beneath, he could already hear voices speaking in tongues.

"Goodbye," Eleanor said in the blackness.

"Goodbye, my dear."

"John . . . your Shangri-La . . . is it really so far away?"

He kissed her for the last time. "It is years away," he said. "And in Time, every single *second* is more than a hundred and eighty-six thousand miles."

The door closed between them, and that was that. He was not good, among other things, at parting speeches. A very long time later, Toby Walker, who had a fix on *Macbeth*, was to say that nothing in his life so ill became John Hillary Dane as the leaving of it.

TRAFFIC PROBLEM

By William Earls

Extrapolation is one of the basic functions of science fiction. William Earls tackles the problem of the snarling traffic which each day frustrates and maddens the inhabitants of the world's major cities. In an all-too-real satire he sets down in the logical future. If you're bothered by the hustle and bustle, take 'er out of gear and relax a while to gloat over somebody else's . . .

TRAFFIC PROBLEM

DAVIS TOOK the third expressway from 42nd Street to the site of the old Rockefeller Center, dropped down through the quadruple overpass and braked to a halt in the fourth level lot. He paused a moment before alighting from the car, trying to catch his breath—even in the car, with the CO filters on over-duty, the air was terrible. He donned his gas mask before he stepped into the lot, slammed the left-hand door into the unprotected door of the Cadillac parked next to him.

"Serve him right for crossing a parking line," he growled. He jumped aside quickly as a Mustang Mach V whistled past him, slammed around a corner, hurtled down the ramp to the street. He flung a curse after it.

He eased his head out between the parked cars before sprinting across the traffic lane of the parking lot to the elevator on the other side. The attendant rushed to

him, tried to demand the $30 daily fee, stepped back when Davis flashed his Traffic Manager's badge at him. The attendant dropped to his knees in salute, stayed down while Davis rushed past.

His office was on the ground level of the Roads and Traffic Building and when he came off the elevator, the hall was full of dust and a jack hammer was going crazily at one end of it. The man behind it was wearing the light blue of Road Construction Unlimited. Davis remembered the spur route of the 2nd level, 57th Street West that was going through the building's corner. He hadn't expected construction to start this soon.

One wall had been ripped out of the office and the derricks were swinging the steel girders for the spur route into place. More men were driving them into the concrete of the floor, slamming them into place with magn-gun rivets. One of the drivers kept walking to the water cooler and Davis stopped him.

"That stuff is three dollars a gallon, buddy," he said.

"Road crew, Mac." The big man tried to push him aside and Davis flashed the badge.

"This is still my office," he said. He crossed to the control board, buzzed the Director.

"Davis in," he said.

I suppose the old bastard will want a report already . . .

"Right," the Director's secretary said, "I'll tell him."

Leingen waved at him from the casualty table and he trotted over, flashed the badge and Leingen nodded. He was off duty now, officially relieved—and he looked relieved.

Lucky bastard will be home in three hours—if he makes it . . .

The casualty report was horrendous, up 4.2% over the day before—with 17 dead on the United Nations area overpass alone. He dialed Road Service.

"Road," the voice on the other end said.

"Traffic Manager. Send a bird. I'm going up for a look." He checked some of the other reports—two

breakdowns on the fifth level of the Tappan Zee bridge, both '79 Fords. Goddam people had no right driving two-year-old cars on the roads anyway. He buzzed Arrest Division.

"All 'seventy-nine Fords off the roads," he said.

"Rog." On the board he watched the red dots that were the Fords being shuttled off to the waiting ramps, clogging them. He flipped a visual to one of them, saw the cars jamming in and the bulldozers pushing them closer. The din around him was increasing and pieces of plasta-plaster were starting to fall from the ceiling.

"Slap up a privacy screen," he ordered. He received no answer and looked at one of the workmen driving the rivets for the girders. Jones wasn't there, he thought suddenly. Of course not, that girder is where his desk was. He'd miss Jones.

"That ain't a priority job, buddy," the workman said. "You want materials, get 'em from Construction."

DAVIS GROWLED, checked his watch. 0807. Things were just moving into the third rush period. Almost on cue the building began to quiver as the lower echelon office workers hurtled by in their Lincolns and Mercuries to obscure little jobs in obscure little offices.

A short buzz came from the main phone. The Director.

"Yes, sir," Davis said.

"Davis?" the palsied voice said. *Die, you old bastard,* Davis thought. "Casualties are up all over."

"The roads are jammed, sir."

"You're Manager. Do something."

"We need more roads. Only you can authorize em."

"We don't have any more roads. But that traffic must move. Do what you have to." The voice went into a coughing spasm. "When you're Director, you build roads."

"Yes, sir." He punched off. All right, he'd move the traffic. Say this for the Director—he'd back a Manager all the way.

"The bird's here," the intercom said.

"Smith," Davis said. His assistant looked up from the main board. "You're in charge. I'm going up." He moved to the elevator, bounced up, flipped his telecorder to audio, caught the information as he hurtled toward the tenth floor.

"Major pileup at Statue of Liberty East," the speaker barked. "Seventeen cars and a school bus. Ambulance on the scene. Structural damage on Fifth level East, Yankee Stadium Speedway. More accidents on Staten Island One, Two, Four, Ten, Thirteen, and Twenty-Two; East Side Four, Nine, and Eleven—" Davis punched off. Matters were worse than he had thought.

On the fifth floor he changed elevators to avoid the ramp from the exact-change lane to the fourth level, zipped to the roof and the waiting helicopter.

"Fifty-car pileup on Yankee Stadium Four," the helicopter radio screamed and he punched the button to Central.

"Davis."

"Yes, sir?"

"What's the time on next of kin identification?" he asked.

"Twenty-three minutes, sir."

"Make it nineteen. Inform all units."

"Yes, sir."

"Lift off," he growled at the pilot. He threw his eyes out of focus, watching the cars hurtling by the edge of the roof.

I could reach out and touch them—*and have my arm torn off at 100 miles an hour . . .*

He coughed. He always forgot to don his gas mask for the short trip from the elevator to the bird and it always bothered his lungs.

The smog was fortunately thin this morning and he could see the gray that was Manhattan below him. Southward he could make out the spire of the Empire State Building rising forty stories above the cloverleaf around it and beyond that the tower of the Trade

Center and the great hulk of the parking lot dwarfing it.

"Hook right," he ordered the pilot, "spin down along the river."

There was a pile-up at the Pier 90 crossover and he saw a helicopter swooping down to pick up the mangled cars at the end of a magnet, swing out across the river to drop them into the New Jersey processing depot.

HE BUZZED the Director as he saw the wrecks piling up in front of the three big crunchers at the depot. They were hammering broken Fords and Buicks into three-foot lumps of mangled steel, spitting them onto the barges. The barges were then being towed out to Long Island Sound for the new jetport. But fast as the crunchers were, they were not fast enough. With a capacity of only 200 cars an hour apiece, they could not keep pace with the rush-hour crackups.

"Yes, Davis," the Director wheezed.

"Would you call U.S. Steel," Davis asked. "We need another cruncher."

"Well, I don't know if we really do—but I'll call."

Davis punched off angrily.

His practiced eye gauged the flow of traffic on the George and Martha Washington Bridges. The cars were eighty feet apart and he ordered a close to seventy-two, effectively increasing the capacity by ten per cent. That was almost as good as another level—but not good enough.

The traffic lane above the piers was packed and smoke from ships was rising between the two twelve-lane sections. Trucks loaded with imports paused for a moment at the top of the ramps were steam catapulted into the traffic. He saw one truck loaded with what looked like steel safes, hit by a Cadillac, go out of control, hurtle over the edge of the roadway and fall one hundred feet—five levels—to the ground. The safes went bouncing in every direction, slamming into cars

on every level. Even two hundred feet above the scene he could hear the scream of brakes and the explosions as the autos crashed and burned. He punched for Control.

"Scramble an ambulance to Pier Forty-six, all levels," he said.

He smiled. It was always good to be the first to report an accident. It showed you hadn't forgotten your training. He had reported four one morning, a record. But now there were bounties for accident reporting and it was rare when a traffic man could actually turn one in. At one time traffic accidents had been reported by the police, but now they were too busy tracking down law violators. An accident was harmful only in that it broke the normal traffic flow.

Traffic was heavy on all levels, he saw—he could actually see only three levels down and there were as many as eight below that—and the main interchange at Times Square was feeding and receiving well. The largest in Manhattan, it spanned from 42nd Street to 49th and from Fourth to Eighth Avenues. There had been protests when construction had started—mostly from movie fans and library fanatics—but now it was the finest interchange in the world, sixteen lanes wide at the 42nd Street off ramp, with twelve exact change lanes. Even the library fans were appeased, he thought: it had been his idea to move the library lions from the old site—they would have been destroyed with the rest of the building had he not spoken—to the mouth of the Grand Central speed lane to Yankee Stadium.

The helicopter banked, headed down the West Side parkway toward the Battery interchange and the Statue of Liberty crossover. It had been clever of the design engineers to use the Bedloe's Island base of the statue for the crossover base—it had saved millions over the standard practice of driving piles into the harbor water. The copper had brought a good salvage price, too.

Of course, the conservationists, the live-in-the-past-people, had objected here, too. But, as always, they

were shouted down at the protest meetings. The traffic had to roll, didn't it?

Below the helicopter Manhattan was a seething mass of speeding cars—reds, blacks, blues, and this month's brilliant green against the background of concrete and asphalt. There were quick flashes of brake lights, frightened blurs as a tie rod snapped or a tire blew. Dipping wreckocopters swooped in to pluck cars and pieces of cars from the highways before the lanes jammed. The island was 200 lanes wide at the top, widened to 230 at the base with the north-south lanes over the sites of the old streets running forty feet apart, over, under, and even through the old buildings. It was the finest city in the world, made for and by automobiles. And he controlled, for eight hours a day anyway, the destiny of those automobiles. He felt the sense of power he always had here in the helicopter, swooping above the traffic. It passed quickly—it always did—and he was observing clinically, watching the flow.

"There," he said to the pilot, indicated the fifth lane on the pier route. A dull red Dodge was going sixty-five, backing up the traffic for miles. There was no room to pass, and, with the traffic boiling up out of the tunnels and bridges onto the road, a jam was inevitable. "Drop," he ordered, moved behind the persuader gunsight, lined the Dodge in the cross hairs.

He fired and watched the result. The dye marker smashed on the Dodge's hood, glowed for a moment. Warned, the driver moved to a sane 95. But the dye stayed and the driver would be picked up later in the day—the dye was impossible to remove except with Traffic-owned detergent—and sentenced. For first clogging, the fine was only $200, but for later offenses, drivers were banned from the road for five to 100 days, forced to ride the railways into town. Davis shuddered at the thought.

Battery Point and Bedloe's Island looked good and the copter heeled. He used the binoculars to check the Staten Island Freeway, saw that it was down to sixteen

lanes coming into New York from the high of twenty-two. The main rush was almost over and he could start preparing for the early lunch rush.

THERE WAS still a pile up at the Trade Center. The one lower, two had been planned, was standing high above the highways around it, with the great bulk of the parking lot building rising above it, the smog line lapping at the seventy-ninth floor. He saw the red lights in the first 92 floors of the lot signifying full, knew that the remaining 40 floors would not take all of the cars still piling in from the twenty-five feeder lanes. He buzzed Control.

"Yes, sir?" the voice said.

"Davis. Get me Parks and Playgrounds."

"Parks and Playgrounds?" The voice was incredulous.

"Right." He waited and when a voice answered, spoke quickly, did his best to overpower the man on the other end.

"Traffic Manager Davis," he snapped. "I want Battery Park cleared. I'm preparing to dump two thousand cars there in five minutes."

"You can't—"

"'The hell I can't! I'm Traffic Manager. Clear the park—"

What there was left of it—the grass fighting for air against the exhaust fumes, dying in the shadow of the interchange above it, stomped to death as the millions of city dwellers flocked to the only green in eleven miles—Central Park had been a bastion for a long time but it was too open, too convenient. It was buried now under a rising parking lot and seven levels of traffic. As a concession to the live-in-the-pasters the animal cages had been placed on the parking lot roof and stayed there for two weeks until they had been hit by a drunk in a Lincoln. There had been a minor flap then with the carbon-monoxide drugged animals prowling the

ramps until they had been hunted down by motorcyclists.

"What about the people?" Parks and Playgrounds asked.

"Sorry about that. They have four and a half minutes." He punched off, buzzed Beacons and Buzzers.

"Davis," he said. "Re-route Battery Five, ramps two through ten, into Battery Park."

"Right." He buzzed Lower City, ordered Wall Street closed for seven blocks. Later in the day they'd have to reroute the traffic around it. No matter, the tie-up lasted for four hours anyway.

The big pile-up, as always, was at the Empire State building where the main north-south curved twelve lanes out of the way to avoid the huge building. And, as they curved, tires skidded on the pavement, cars clawed to the side and, day after day, car after car lost control on the corner, went plunging over the side to shatter on the ramps below. It was, in many ways, the best show in town and office workers crowded the windows to watch the cars spin out of control. Today the traffic looked almost good and he clocked the pack at 110 on the corner, 115 coming out of it. Still not good enough, though—they were braking coming into the corner, losing time, and the line was thin as they came out of it. He watched a Buick skid, hit the guardrail, tip, and the driver go flying out of the convertible top, land in the level below, disappear in the traffic stream. The car rolled, plummeted from sight.

"Home," he said. The helicopter dropped him on the roof and he gagged against the smog, trotted to the elevator, dropped. The building was shaking from the traffic noise and the hammering of rivets. He coughed on the dust.

HE CHECKED the casualty lists, initialed them. Above normal, with the Empire State section running 6.2% ahead of last week. He was listed as reporting the pier pile-up, and there was a report stating Battery Park was

filled—there was also a note saying that the Director was catching hell for parking cars there. To hell with him, Davis thought. There was another complaint to his attention from Merrill Lynch, Pierce, Fenner and Agnew. Two of their board members were caught in the Wall Street jam and were late for work. He threw it into the wastebasket. Outside (inside?)—hard to say with no wall on one side of the building—the workmen were throwing up the steel plates for the ramp, stinting on the bolts to save time.

"Put the damn bolts in," Davis roared. "That thing will shake enough anyway."

The din was tremendous even now, with seven ramps of traffic passing within thirty feet. It would be worse when the spur route was finished. He hoped that they would put the wall back on the office. He buzzed Smith, asked for a readout on the Empire State complex.

"Fourteen fatalities since nine o'clock."

It was now 10:07 and the pre-lunch rush was due to start in four minutes.

"Damn Empire anyway," he said. The United Nations interchange board went red and he went to visual, saw a twelve-car pileup on the fourth level, the bodies and pieces of bodies, the cars and pieces of cars falling into the General Assembly. Damn! he could expect another angry call from the Secretary General. Damn foreigners anyway, when did they get the idea that their stupid meetings were more important than traffic?

The red phone rang—the Director—and he lifted it. "Davis."

"Everything's running higher," the Director wheezed. "What's the story?"

"Empire's the big tie-up," Davis said. "That and some construction."

"Do something. I gave you the authority."

"Get rid of Empire," Davis said. "Get another forty decks on the Trade parking lot, too."

"Can't be done." The hell it can't, Davis thought.

You're just afraid of the conservationists. Coward.

"Do something."

"Yes, sir." He waited until the phone clicked dead before he slammed it down. He took a deep breath of the air in the office—it was even better than smoking. Then he began to bark orders over the All Circuits channel.

"Scramble another ten wreckocopters," he snarled. With half again as many copters, wrecks would be cleared that much faster. "Cut next of kin time to fifteen minutes." He was going out on a limb here, but it would speed the processing of accidents through Brooklyn and New Jersey. Now, with the rush hour just over and another beginning, wrecks were piling up outside the receiving centers and the crunchers were idle half the time. "Up minimum speed five miles an hour." That would make it at least 100 miles an hour on every highway, 65 on the ramps. He flipped to visual, saw Beacons and Buzzers post the new speeds, saw the cars increase speed. Wrecks and Checks flashed the going aloft of the ten copters and he breathed easier, flipped to visual at Empire, saw the day's third major pile-up on the third level, cursed. He closed the 34th Street cutoff, ordered three payloaders to dump all wrecks right there, flashed a message to Identification to have a team posted. By midnight, when the traffic eased, they could begin moving the cars and bodies to New Jersey.

The red phone rang, three rings. Double urgent. He grabbed it, barked his name.

"The Director just dropped dead," a hysterical voice said. "You're acting Director."

"I'll be right there." Acting, hell. There were six hours left on his shift and he could get something done now. He turned to Smith. "You're Manager now," he said, "I just got bumped upstairs."

"Right." Smith barely looked up. "Reopen Yonkers Four, lanes one through nine," he said.

He had made the transition from assistant to Manager in an instant. Training, Davis thought.

He took the elevator to the eighth floor, the Director's office. The staff was quiet, looking down at the body on the floor. There were four boards flashing, a dozen phones ringing. Davis snapped orders quickly.

"You, you and you, answer the phones," he said. "You and you, get the boards. You, drag that body out of here. You—" he pointed at the Director's—his—secretary— "call a staff conference. Now."

He looked at the boards, checked Traffic, Beacons and Buzzers, Wrecks and Checks, Gate Receipts and Identification. Fatalities was doing extremely well—Wellborn was the new Manager here. The crunchers were doing well. Wrecks was reporting above normal pickup time.

"The Director's dead," he told the staff. "I'm new Director." They all nodded. "Most departments look pretty good," he said. He looked at Smith. "Traffic flow is lousy," he said. "Why?"

"Empire," Smith said. "We're losing twenty per cent just going around that goddamed building."

"How are your crews fixed for a major job?" Davis asked the Construction Manager.

"Okay." The Manager ticked off eleven small jobs.

"The problem is at Empire," Davis said flatly. "We can't get around the building." He looked at Construction. "Tear it down," he said. "Meeting adjourned."

Later that day he looked south from the roof. The Destruction team had the top ten floors off the Empire State Building and a corner cut of the fortieth floor with a lane of traffic whipping through it. The flow was good and he smiled. He couldn't remember doing anything so necessary before.

ABOUT A SECRET CROCODILE

By R. A. Lafferty

Here's the real *inside story on who controls public opinion. The trend-makers, the mind-benders, the fiends who make you want what you want and do what* they *want—they're all exposed in the following delightful spoof . . .*

ABOUT A SECRET CROCODILE

THERE IS a secret society of seven men that controls the finances of the world. This is known to everyone but the details are not known. There are some who believe that it would be better if one of those seven men were a financier.

There is a secret society of three men and four women that controls all the fashions of the world. The details of this are known to all who are in the fashion. And I am not.

There is a secret society of nineteen men that is behind all the fascist organizations in the world. The secret name of this society is Glomerule.

There is a secret society of thirteen persons known as the Elders of Edom that controls all the secret sources of the world. That the sources have become muddy is of concern to them.

There is a secret society of only four persons that manufactures all the jokes of the world. One of these persons is unfunny and he is responsible for all the unfunny jokes.

There is a secret society of eleven persons that is

behind all Bolshevik and atheist societies of the world. The devil himself is a member of this society, and he works tirelessly to become a principal member. The secret name of this society is Ocean.

There are related secret societies known as The Path of the Serpent (all its members have the inner eyelid of snakes), The Darkbearers, the Seeing Eye, Imperium, The Golden Mask and the City.

Above most of these in a queer network there is a society that controls the attitudes and dispositions of the world—and the name of it is Crocodile. The Crocodile is insatiable: it eats persons and nations alive. And the Crocodile is very old, 8809 years old by one account, 7349 years old if you use the short chronology.

There are subsecret societies within the Crocodile: Cocked Eye, the Cryptic Cootie and others. Powerful among these is a society of three hundred and ninety-nine persons that manufactures all the catchwords and slogans of the world. This subsociety is not completely secret since several of the members are mouthy: the code name of this apparatus is the Crocodile's Mouth.

Chesterton said that Mankind itself was a secret society. Whether it would be better or worse if the secret should ever come out he did not say.

And finally there was—for a short disruptive moment—a secret society of three persons that controlled all.

All what?

Bear with us. That is what this account is about.

JOHN CANDOR had been called into the office of Mr. James Dandi at ABNC. (Whisper, whisper, for your own good, do not call him Jim Dandy; that is a familiarity he will not abide.)

"This is the problem, John," Mr. Dandi stated piercingly, "and we may as well put it into words. After all, putting things into words and pictures is our way of working at ABNC. Now then, what do we do at ABNC, John?"

(ABNC was one of the most powerful salivators of the Crocodile's Mouth.)

"We create images and attitudes, Mr. Dandi."

"That is correct, John," Mr. Dandi said. "Let us never forget it. Now something has gone wrong. There is a shadowy attack on us that may well be the most damaging thing since the old transgression of Spirochaete himself. Why has something gone wrong with our operation, John?"

"Sir, I don't know."

"Well then, what has gone wrong?"

"What has gone wrong, Mr. Dandi, is that it isn't working the way it should. We are caught on our own catchwords, we are slaughtered by our own slogans. There are boomerangs whizzing about our ears from every angle. None of it goes over the way it is supposed to. It all twists wrong for us."

"Well, what is causing this? Why are our effects being nullified?"

"Sir, I believe that somebody else is also busy creating images and attitudes. Our catechesis states that this is impossible since we are the only group permitted in the field. Nevertheless, I am sure that someone else is building these things against us. It even seems that they are more powerful than we are—and they are unknown."

"They cannot be more powerful than we are—and they must not remain unknown to us." Mr. Dandi's words stabbed. "Find out who they are, John."

"How?"

"If I knew how, John, I would be working for you, not you working for me. Your job is to do things. Mine is the much more difficult one of telling you to do them. Find out, John."

JOHN CANDOR went to work on the problem. He considered whether it was a linear, a set or a group problem. If it were a linear problem he should have been able to solve it by himself—and he couldn't. If it were

a set problem, then it couldn't be solved at all. Of necessity he classified it as a group problem and he assembled a group to solve it. This was easy at ABNC which had more group talent than anybody.

The group that John Candor assembled was made up of August Crayfish, Sterling Groshawk, Maurice Cree, Nancy Peters, Tony Rover, Morgan Aye, and Betty McCraken. Tell the truth, would you be able to gather so talented a group in your own organization?

"My good people," John Candor said, "as we all know, something has gone wrong with our effects. It must be righted. Thoughts, please, thoughts!"

"We inflate a person or subject and he bursts on us," August gave his thought. "Are we using the wrong gas?"

"We launch a phrase and it turns into a joke." Sterling complained. "Yet we have not slighted the check-off: it has always been examined from every angle to be sure that it doesn't have a joker context. But something goes wrong."

"We build an attitude carefully from the ground up," Maurice stated. "Then our firm ground turns boggy and the thing tilts and begins to sink."

"Our 'Fruitful Misunderstandings,' the most subtle and effective of our current devices, are beginning to bear sour fruit," Nancy said.

"We set ourselves to cut a man down and our daggers turn to rubber," Tony Rover moaned. (Oh, were there ever sadder words? Our daggers have turned to rubber.)

"Things have become so shaky that we're not sure whether we are talking about free or closed variables," Morgan gave his thought.

"How can my own loving mother make such atrocious sandwiches?" Betty McCracken munched distastefully. Betty, who was underpaid, was a brown-sack girl who brought her own lunch. "This is worse than usual." She chewed on. "The only thing to do with it is

feed it to the computer." She fed it to the computer which ate it with evident pleasure.

"Seven persons, seven thoughts," John Candor mused.

"Seven persons, six thoughts," Nancy Peters spat bitterly. "Betty, as usual, has contributed nothing."

"Only the first stage of the answer," John Candor said. "She said 'The only thing to do with it is to feed it to the computer.' Feed the problem to the computer, folks."

They fed the problem to the computer by pieces and by wholes. The machine was familar with their lingos and procedures. It was acquainted with the Non-Valid Context Problems of Morgan Aye and with the Hollow Shell Person Puzzles of Tony Rover. It knew the Pervading Environment Ploy of Maurice Cree. It knew what trickwork to operate within.

Again and again the machine asked for various kinds of supplementary exterior data.

"Leave me with it," the machine finally issued. "Assemble here again in sixty days, or hours—"

"No, we want the answers right now," John Candor insisted, "within sixty seconds."

"The second is possibly the interval I was thinking of," the machine issued. "What's time to a tin can anyhow?" It ground its data trains for a full minute.

"Well?" John Candor asked.

"Somehow I get the number three," the machine issued.

"Three what, machine?"

"Three persons," the machine issued. "They are unknowingly linked together to manufacture attitudes. They are without program or purpose or organization or remuneration or basic or malice."

"Nobody is without malice," August Crayfish insisted in a startled way. "They must be totally alien forms then. How do they manage their effects?"

"One with a gesture, one with a grimace, one with an intonation," the machine issued.

"Where are they?" John Candor demanded.

"All comparatively near." The machine drew three circles on the city map. "Each is to be found in his own circle most of the time."

"Their names?" John Candor asked and the machine wrote the name of each in the proper circle.

"Do you have anything on their appearances?" Sterling Groshawk inquired and the machine manufactured three kymograph pictures of the targets.

"Have you their addresses or identifying numbers?" Maurice Cree asked.

"No. I think it's remarkable of me that I was able to come up with this much," the machine issued.

"We can find them," Betty McCracken said. "We can most likely find them in the phone book."

"What worries me is that there's no malice in them," John Candor worried. "Without malice, there's no handle to get hold of a thing. The Disestablishment has been firmly established for these several hundred years and we hold it to be privileged. It must not be upset by these three randoms. We will do what we must do."

MIKE ZHESTOVITCH was a mighty man. One does not make the primordial gestures out of weak body and hands. He looked like a steel worker—or anyhow like a worker at one of the powerful trades. His torso was like a barrel but more noble than ordinary barrels. His arms and hands were hardly to be believed. His neck was for the bulls, his head was as big as a thirteen gallon firkin, his eyeballs were the size of ducks' eggs and the hair on his chest and throat was that heavy black wire-grass that defies steel plowshares. His voice—well he didn't have much of a voice—it wasn't as mighty as the rest of him.

And he didn't really work at one of the powerful trades. He was a zipper repairman at the Jiffy Nifty Dry Cleaners.

August Crayfish of ABNC located Mike Zhestovitch in the Blind Robbin Bar which (if you recall the way

that block lies) is just across that short jog-alley from the Jiffy Nifty. And August recognized big Mike at once. But how did big Mike get his effects?

"The Cardinals should take the Colts today," a serious man there was saying.

"The Cardinals—" Mike Zhestovitch began in the voice that was less noble than the rest of him, but he didn't finish the sentence. As a matter of fact, big Mike had never finished a sentence in all his life. Instead he made the gesture with his mighty hands and body. Words cannot describe the gesture but it was something like balling up an idea or opinion in the giant hands and throwing it away, utterly away, over the very edge of contempt.

The Cardinals, of course, did not take the Colts that day. For a moment it was doubtful whether the Cardinals would survive at all. From the corner of the eye, red feathers could be seen drifting away in the air.

August Crayfish carefully waited a moment and watched. A man walked out of the Blind Robin and talked to another man in that little jog-alley. From their seriousness it was certain that they were talking baseball.

"The Cardinals—" the first man said after a moment, and he also made the gesture. And seconds later a man playing eight-ball in the back of the Blind Robbin did the same thing.

August was sure then. Mike Zhestovitch not only could shrivel anything with the gesture, but the gesture as he used it was highly epidemic. It would spread, according to Schoeffler's Law of Dispersal, through the city in short minutes, through the world in short hours. And no opinion could stand against its disfavor. Mike Zhestovitch could wreck images and attitudes—and possibly he could also create them.

"Do you work alone?" August Crayfish asked.

"No. The rip-fix and the button-sew girls work in the same cubbyhole," Mike said with his curiously small voice.

"Do you know a Mary Smorfia?" August asked.

"I don't, no," Mike said, a certain comprehension coming into his ducks'-egg-sized eyes. "And you are glad that I don't? Then I will. I'll find out who she is. I see it now that you are a wrong guy and she is a right girl."

Then August Crayfish spoke the slogan that would be unveiled to the ears of the world that very night, a wonderfully slippery slogan that had cost a hundred thousand dollars to construct. It should have warned Mike Zhestovitch away from his mad resistance.

Mike Zhestovitch made the gesture, and the slogan was in ruins. And somewhere the Secret Crocodile lashed its tail in displeasure.

"Do you want to make a lot of money?" August Crayfish whispered after a long reevaluation pause.

"Money—from such as you—" Big Mike didn't finish the sentence, he never did. But he made the gesture. The idea of a lot of money shriveled. And August Crayfish shriveled so small that he could not climb over the threshold of the Blind Robbin on the way out and had to be aided over it by the shod—toe of a kind man. (This last statement is a literal exaggeration but it is the right direction.)

NANCY PETERS of ABNC located Mary Smorfia in the King-Pin Bowling Alley, where she was a hamburger waitress and a beer buster. Mary was small, dark, unpretty (except for her high-frequency eyes and the beautiful gash across her face that was her mouth), lively, smart, busy, a member of that aberrant variety of the human race that was called Italian.

"Snorting Summer should take the Academy Award," one nice guzzling lady at the counter was saying to another, "and Clover Elysée is the shoeless shoo-in for best actress of the year."

And Mary Smorfia made the grimace. Ah, it was mostly done with the beautifully large mouth and yet every part of her entered into it, from the blue lights in

her hair to her crinkly toes. It was a devastating, all-destroying grimace. It gobbled up, it nullified and it made itself felt to a great distance. The nice guzzling lady had not even been looking toward Mary Smorfia but she felt the grimace like a soul shock, and she herself did the grimace with a wonderful distortion of the features that weren't made for it.

And the grimace swept everything like quick contagion or prairie fire. Snorting Summer—gah! Clover Elysée—guggling gah! Those things were finished forever, beyond laughter, below derision. And Nancy Peters of ABNC noted the powerful effect carefully, for the original words of the nice guzzling lady were the very words that ABNC had selected to be echoed a hundred million times whenever the awards were thought of.

"Do you work alone?" Nancy Peters asked Mary Smorfia.

"Kid, I am so fast they don't need anyone else on this shift. I'm like silly lightning."

"Did you ever think of becoming an actress, Mary?" Nancy asked in honey-tones.

"Oh, I made a commercial once," Mary said out of her curly gash-mouth (she had to be kidding: she couldn't really have a mouth that looked like that). "I don't know whether I sold much of my guy's soap but I bet I got a lot of people off that Brand X. Ashes it was, worse even, after I monkey-faced it. They say I'm a natural—but once is enough."

"Do you know a Mike Zhestovitch or a Clivendon Surrey?" Nancy asked.

"I don't think so," Mary said. "What league do they bowl in? I bet I will like them both, though, and I will remember their names and find them."

Nancy Peters was nervous. She felt that the annihilating grimace was about to strike again on Mary's lightning-gash mouth. But it was time for the test of strength. Nancy spoke the new slogan that had been selected for presentation to the world that very night, a

wonderfully convincing and powerful slogan that should bring this random Mary Smorfia to heel if anything could. And she spoke it with all the absolute expertise of the Crocodile's Mouth behind her.

The Grimace! And the slogan was destroyed forever. And (grimacing horror turned inward) Nancy caught the contagion and was doing the grimace herself. She was quite unable to get the thing off her face.

Sheer humiliation overwhelmed the Nancy person, who had suddenly been made small. And somewhere the Secret Crocodile lashed its tail in displeasure and unease.

"Do you want to make twenty thousand dollars, Mary?" Nancy asked after she had returned from the jane where she had daubed her flushed face and cooled her flustered body.

"Twenty thousand dollars isn't very much," Mary Smorfia sounded out of her panoramic mouth. "I make eighty-eight fifty now after everything. I could make a lot more if I wanted to go along with the cruds."

"Twenty thousand dollars is very much more," Nancy Peters said enticingly.

"It is very much more cruddy, kid." Mary Smorfia grimaced. Grimaced! Not again! Nancy Peters fled in deflated panic. She felt herself dishonored forever.

Well, do you think it is all water-melon pickles and pepper relish, this unilaterally creating all the images and attitudes for the whole world? It isn't. It is a detailed and devious thing and the privileged Disestablishment had been building it for centuries. (The Establishment itself had been no more than a figure of speech for most of those centuries, a few clinging bits of bark: the heart of the tree had long been possessed by the privileged Disestablishment.) Three quick random persons could not be permitted to nullify words from the Mouth itself.

MORGAN AYE of ABNC located Clivendon Surrey in Speedsters' Café. Clivendon was a lank and fair-haired

man with a sort of weariness about him, a worldiness that had to be generations old. He had the superior brow and the thoroughbred nose that isn't grown in short centuries. He had the voice, the intonation, the touch of Groton, the touch of Balliol, the strong touch of other institutions even more august. It was a marvelous voice, at least the intonation of it. Clivendon's employer once said that he didn't believe that Clivendon ever spoke in words, at least not in any words that he was ever able to understand. The intonation was really a snort, a sort of neigh, but it carried the cresting contempt of the ages in its tone .And it was contagious.

Clivendon was really of Swedish extraction and had come off a farm near Pottersville. He had developed that intonation for a role in a high-school play. He had liked it and he had kept it. Clivendon was a motorcycle mechanic at Downhillers' Garage.

"Do you work alone?" Morgan Aye asked Clivendon.

"Naeu. You work alone and you got to work. You work with a bunch and you can slip out from it," Clivendon intoned. Yes, he talked in words and the words could be mostly understood. But the towering intonation was the thing, the world-wilting contempt of the tone. This man was a natural and Morgan felt himself a foot shorter in the very presence of that tone.

"Do you know a Mike Zhestovitch or a Mary Smorfia?" Morgan asked fearfully.

"That's a funny thing." The tone cut through earwax and the soft spots of the spleen. "I had never heard of them but Mary Smorfia called me up not thirty minutes ago and said that she wanted both of us to meet Mike. So I'll meet them in about twenty minutes, as soon as the clock there says that I'm supposed to be off work at Downhillers' Garage."

"Don't meet them!" Morgan cried out violently. "That might be the closing of the link, the setting up of a league. It might be an affront to the Mouth itself."

The tone, the neigh, the snort, the sharp edge of a

wordless intonation sent Morgan reeling back. And there were echoes of it throughout Speedsters' Café and in the streets outside. The tone was as contagious as it was cutting.

Morgan started to speak the newest selected slogan from the Mouth—and he stopped short. He was afraid of the test of strength. Two very expensive slogans had already been shattered today by these randoms. 'No malice in the three,' the computer had said and: 'without malice, there's no handle to get hold of a thing,' John Candor had stated. But somewhere in that mountainous and contagious contempt of tone that belonged to Clivendon Surrey had to be some malice. So Morgan Aye reached for what had always been the ultimate weapon of the Crocodile's Mouth. It always worked—it always worked if any malice at all existed in the object.

"How would you like to make five thousand dollars a week?" he whispered to Clivendon.

"What garage pays that much?" Clivendon asked in honest wonder. "I'm not that good a motorcycle mechanic."

"Five thousand dollars a week to work with us at ABNC," Morgan tempted. "We could use you in so many ways—that marvelous scorn to cut down any man we wished! You could lend the intonations of your voice to our—"

The neigh was like a thousand sea stallions breaking up from the depths. The snort was one that crumbles cliffs at the ends of the earth. Morgan Aye had gone ghastly white and his ears were bleeding from the transgression of that cutting sound. There were even some words in Clivendon's sounding— "Why, then I'd be one of the birds that picks the shreds of flesh from between the teeth of the monster." Blinding hooting contempt in the tone and Morgan Aye was in the street and running from it.

But the echoes of that intonation were everywhere in that part of town, soon to be all over the town, all over the world. It was an epidemic of snorting at the Cro-

codile's Mouth itself. Fools! Did they know that this was but one step from snorting at the very Crocodile?

THE RING had closed. The informal league had formed now. The three randoms had met and united. The Mouth was affronted. Worse than that, all the outpour of the Mouth was nullified. The whole world was rejecting the catchwords that came from the Mouth, was laughing at them, was throwing them away with the uttermost gesture, was monkey-facing them, was snorting them down, was casting them out with bottomless contempt.

This was the short reign of the secret society of three, who did not know that they were secret. But in their day they closed the Mouth down completely. It was filled with mud and swamp reeds and rotting flesh.

The Secret Crocodile was lashing its tail with acute displeasure now. The Crocodile's Mouth had become quite nervous. And what of the little birds that fly in and out of that mouth, that preen the teeth and glean scraps of flesh and slogans and catchwords there? The birds were in quite an unhappy flutter.

"There is open conspiracy against us by a secret society of three persons," Mr. James Dandi was saying, "and all the world abominates a secret society. We have this thing to do this day—to cripple it forever in its strength. Otherwise we will be cast out and broken as ineffectual instruments and the Crocodile will bring in strong persons from the Cocked Eye or the Cryptic Cootie to take our places. Surely we are not without resources. What is the logical follow-up to the Fruitful Misunderstanding?"

"The Purposive Accident," John Candor said immediately.

"Take care of it, John," Mr. James Dandi said. "Remember, though, that he whose teeth we preen is the very bowels of compassion. I believe this is the salient thing in the world in our day, the Compassion of the Crocodile."

"Take care of it, people," John Candor said to his seven talented ones, "remembering always that the Crocodile is the very belly of compassion."

"Take care of it," the seven said to the computer, "always within the context of the jaws of compassion."

The computer programed a Purposive Accident to happen and manufactured such props as were needed. And the Purposive Accident was very well programed.

There was no great amount of blood poured out. No persons were killed except several uninvolved bystanders. The secret three were left alive and ambulant and scathed only at their points of strength.

It happened in the block between the Blind Robbin Bar and Speedsters' Café when all three members of the secret society happened to be walking together. The papers called it a bomb; they call everything a bomb that goes off like that. It was really a highly sophisticated homing device with a tripartite programing and it carried out its tripartite mission.

All three randoms, former members of the short-lived secret society, are well and working again. Mike Zhestovitch is no longer a zipper repair man (it takes two talented hands to fix those zippers), but he still works at the Jiffy Nifty Dry Cleaners. He runs one of those big pressers now which he can easily do with his powerful and undamaged left hand and his prosthetic right hand. But without his old right hand he can no longer make the contagious primordial gesture that once dumbfounded the Mouth and all its words. You just cannot make the big gesture with a false hand.

Mary Smorfia still works at the King-Pin Bowling Alley as hamburger waitress and beer buster. She is still small, dark, unpretty (except for her high-frequency eyes), lively, smart, and Italian. Her mouth is still a gash across her face, but now it is twice as great a gash as it used to be, and it no longer has its curled liveliness. Its mobility is all gone, it will no longer express the inexpressible, will no longer shatter a

phrase or an attitude. Mary Smorfia is as she always was, except that now she is incapable of the famous grimace.

Clivendon Surrey is again a motorcycle mechanic at Downhiller's Garage and again he spends most of his time in Speedsters' Café. His vocal cords are gone, of course, but he gets by: he is able to speak with a throat microphone. But the famous intonation, the neigh, the destroying snort are all impossible for him.

The trouble is over with. Now again there is only one organization in the world to create the images and attitudes of the world. This insures that only the standard attitudes of the Disestablishment shall prevail.

IN OUR opening catalog we forgot one group. There is another secret society in the world composed of the good guys and good gals. It has no name that we have ever heard except just the Good Guys and Good Gals. At the moment this society controls nothing at all in the world. It stirs a little, though. It may move. It may collide, someday, even with the Secret Crocodile itself.

OUT OF MINDSHOT

By John Brunner

In a brief but telling story by one of the genre's most sensitive and prolific writers, John Brunner shows us the moral dilemma of the telepath. Hidden in the dark recesses of the evil mind are deep fears and hatreds. Unleashed, these thoughts can cause untold harm for everyone, including the source!

ON AN outcropping ledge of rock Braden paused for a moment, narrowing his eyes against the sun. He glanced back down the dusty trail—not that it really deserved that name, since calling it a trail implied the previous passage of someone or something and there were no visible tracks, just a series of negotiable footholds rising stair-fashion on the face of the hill.

From this level he could still see his car, zebra-striped by the shadow of a tall, branching cactus at the point where the ground started to slant too steeply for wheels to find purchase. But only a smudge of smoke marked his last stopping place, a settlement not so much a town as an accident, a wrinkle in the sandy ribbon of desert time.

Because that, though, was the place where he had realized he had come to the end of his quest, he kept his eyes fixed on the blur of smoke while he sought the cork of his canteen and raised it in a parody of a toast. He sipped the contents economically and stopped before his thirst was satisfied. Water, he reasoned, must be his quarry's chief problem in this arid valley. Ultimately possession of it might become a weapon.

He replaced the canteen in his pack and turned to study the going ahead of him. By now, he calculated, he must be two-thirds of the way to the top. He had hardly expected to find clues indicating he was on the right track—if his deductions were correct he was dealing with someone desperate enough to take every possible precaution—but he was optimistic. If he did not find what he was looking for on this particular hill, there were others beyond which he could explore tomorrow.

After six years of searching, another few days made little difference.

He shouldered the pack and sought the easiest way to go higher. From this point on the rocks grew craggier and there was no sand, for the cold night wind scoured the hard stone clean. Stolidly he scrambled onward, the sun punishing his back and the sweat vanishing from his skin almost before it oozed out of the pores.

After a while he found himself on the edge of a flat space, a miniature plateau about thirty yards across, flanked by a steep drop into the valley and a nearly vertical cliff forty or more feet high. He removed his pack and tossed it over the lip of the level area, then hauled himself up with much panting and cursing. As he bent to reclaim the pack something caught his attention from the corner of his eye.

A stack of rocks did not quite meet the cliff wall. A shadow beyond them looked like the opening of a cave. He saw a speck of bright, artificial color, a fragment of sun caught on a broken bottle.

While he was still staring the quiet voice from behind him said, "Put up your hands."

Braden strove mentally to quell the flush of jubilation which spread across his mind with cold contrasting thoughts—ordinary thoughts of fear and surprise. When, compliantly, his arms went up in the air they trembled unnecessarily.

"Turn around," said the quiet voice.

He obeyed and had to repress a start of surprise—

how efficiently, he could not be sure, but it was almost certain that his quarry would be preoccupied with alarm at this intrusion, so there was some leeway for uncontrolled reaction. He had expected what pictures had shown him: a pudgy, rather ugly, self-indulgent child. In fact, behind the rifle that was leveled at him over a sheltering rock stood a slim, wiry figure likely to be taller than himself when upright and seeming a good deal tougher.

Though that remains to be decided. . . .

For a while the two studied each other: the hunter in plain sight, clad in open shirt, jeans, heavy climbing boots, the quarry almost hidden by the rock so that the rifle was like a symbol for armor. But the bare tanned arms that were visible were lean and muscular and the face under the roughly cropped fair hair was harsh with enmity.

"All right." The quarry gestured with the muzzle of the gun. "You're not armed, I guess. Move away from your pack, though."

NOW THAT the long-awaited confrontation was upon him, Braden was having trouble controlling his excitement. Doing as he was told, however, he concentrated on simple ideas.

What's all this about? Have I run into a criminal in hiding?

But the next words he heard, uttered in a slow drawl of puzzlement, told him that his precautions were in vain.

"Braden—Daniel Braden, is that right? But I don't know anyone called Braden. And yet you seem to know me."

A headshake. A whitening of the knuckles that still clasped around the stock of the gun. Braden sighed and chose a direct onslaught rather than further prevarication.

"You're not what I expected from your pictures, Lesley."

"What?"

"I thought you'd be fat. You started out fat. But I guess starving in a hole halfway up a mountain—and scrambling up and down that slope every time you need supplies—would take weight off anybody."

Bewilderment was coming to his aid. Uncertain, letting the gun's threatening mouth move to one side, the quarry asked, "Are you somebody who used to know me when?"

Hope, hunger—some kind of craving after human companionship—whatever it was, she moved from behind the protecting rock. Braden studied her critically. She was quite naked, which was among the many things he might have expected but hadn't thought about, because after all who was there for at least five miles in any direction to complain? Her fair hair had been slashed merely to keep it out of her eyes and her face was like the rest of her, tanned to a wooden color by the merciless desert sunshine. But the shape was good—square shoulders contrasted with small round breasts and wide feminine hips—and the lessening of the old puppy-fat allowed her fine bone structure to show through.

God damn, she's turned out beautiful!

That thought, welling from the animal level of his being, breached the careful camouflage beyond repair and his mind bloomed like a beacon. The gun snapped back to its former aim.

"You know me," the words were forced out on breath alone, with no voice to drive them.

"Sure I know you," Braden said. "You're Lesley Wolker, and you can read my mind."

"Oh God. Oh God." The sounds died on the bare face of the hill like seeds cast into crevices among stark rock. "How—how—"

"How did I find you?" Braden supplied briskly, much relieved at the girl's obvious terror. "Why, it was pretty simple really. I started with the premise that there should by now be at least one efficient telepath in

the United States—and possibly more. It was only logical that with the high level of success obtained from randomly chosen subjects by people like Rhine, someone would have been born who was endowed with the full talent. And such a person— Well, you read Wells's *The Country of the Blind?* Only you're in a country of the deaf—and noise can kill."

Lesley's face writhed as though he had put a hot iron to the smooth mound of her belly.

"A person like that would either go insane or run and hide. And in the modern world there aren't many places one can hide. A desert or a mountain seemed to me the only possible places, and if such a person were to be born in the big cities where most of our population is now concentrated, then—short of finding a usable route up to the Canadian backwoods—an area like this one would be the closest and easiest escape hole. I don't know what kind of torment such a person would undergo, but it doesn't take much imagination to figure out that it would be so bad the victim would flee in panic to the nearest lonely spot, without taking time to wonder if later on there would be a chance of moving somewhere else.

"So I took a map and made some measurements—and then I checked the missing persons files in every city where they'd let me get at them and checked those against pertinent genealogical tables and—" Braden snapped his fingers. "Five years of that. More than a year, now, asking around in every hole-in-corner town near the areas I'd selected as possibilities. And in that particular one over there—" he pointed in the general direction of the smoke smudge he had toasted earlier—"they told me about a mysterious woman who occasionally comes down from the hills to buy basic foods, always wearing the same overly tight blouse and shorts which are now pretty well in rags. There's something to be said for old-fashioned prejudices. They talk about your legs every time the conversation gets dull—did you know that? Yes, I guess you must know."

He gave her a grin that turned the corners of his mouth into a sketch for horns.

"Also," he concluded, "you must know what it is I came to get you for."

LESLEY'S FACE had set into a feral mask and the rifle was clutched so tightly that not only her knuckles but half the backs of her hands were white under the sunburn. She uttered a choking gasp and jerked as though to fire.

"One moment," Braden said—and this part of his conversation was one he had rehearsed so many times in his mind he genuinely believed it now. "Are you planning to kill me?"

Lesley gave a violent nod, eyes locked wide open under her sun-bleached lashes.

"But you daren't," Braden said with careful cruelty. "Because you'd know what I was thinking when I died."

He relaxed his mind now and he had a very real fear of death underneath the glacial calm he outwardly affected.

"If you kill me, Lesley, you will feel the bullet, no matter where you put it—unless you hit me in the head and destroy my brain instantly. But I doubt you can do that. I don't see how anyone who can read minds could bear to learn to use a gun so well. You've never felt a slug tear up your belly or fill your lungs with blood but I have. I was out in Viet Nam and I was shot three times. And later I was bayoneted, too. Look inside my head and learn how I remember that. And those were only wounds, Lesley. They weren't death. Death is big and black and final—"

All the time he was talking, soothingly, almost hypnotically, he had been approaching her. Now she regained her presence of mind and advanced the gun as though to skewer him with it.

"You can't use a knife either, Lesley," Braden said in the same flat tone. "Steel in the flesh feels cold and agonizing. You can't use your bare hands because—

even though you're probably as strong as I am after climbing up and down these rocks—every time you hit me you would feel the blow."

Another step—and another. The outstretched gun was beginning to quiver. The girl's eyes were bright with what he confidently took to be tears.

"You can't give me poison because either it hurts or it takes too long. You can't strangle me while I'm asleep, for fear I'd wake and be so terrified you'd have to give up. So you can't kill me, Lesley. You daren't kill me. Doing something like that would drive you insane. You know what suffering does to you, I'm sure—you must have been around people who were dying, maybe after a traffic accident—"

His thick fingers lanced out and clamped on the barrel of the gun, thrusting it aside where its slugs would whine harmlessly away. For a moment he feared she still had enough guts to struggle with him for possession of it but abruptly she let it go and slapped her hands up to her temples.

Another second and she began to cry.

Contemptuously Braden broke the breech of the gun and spilled the shells in a metal rain over the edge of the plateau. About to whirl the weapon itself around his head and fling it far away from the rocks, he paused.

"I'm not throwing this down the hill in case you think to use it as a club and beat me unconscious, by the way," he said. "There isn't any way you could force me to let go of you now I've tracked you down. You can't torture me or compel me. You see, I've known for a long time that I wouldn't need to come armed against someone like you. I had a very strict and puritanical upbringing. It left me conditioned in a certain fundamental way. Of course, by now you've probably worked out what I'm going to tell you but I'll say it in words just to avoid misunderstandings."

He stared at her piercingly.

"You were a pretty big girl when life became too

much for you—seventeen, weren't you, when you vanished from your family and home? So you probably knew the facts of life. And I don't think I need to tell you what a masochist is!"

He raised the rifle and hurled it as far as he could. Dusting his hands, he turned to confront Lesley.

"But a masochist isn't simply someone who likes to be hurt—that's a common error. It's someone who needs to be hurt, and the more he's hurt the better able he is to let go and grab after the gratification that he wants. You can't bear to be near someone who's being hurt, let alone to be hurt yourself. It's going to be an unequal struggle, isn't it?"

Tear-stained, her face rose from the shelter of her hands.

"What do you want from me?" she whispered.

"You have to ask?" Braden gave a thick triumphant laugh. "Don't try and fool me. You know very well what I want from you. Go on, admit it."

"You—" The first attempt at an answer died in a gasp, and she tried again. "You think that with me to read other people's minds for you you could—"

"Let's hear it. Finish the sentence, baby."

"You could rule the world."

"That's right," Braden agreed. "Or if you went crazy from the pressure—at least I'd have collected enough secrets to buy the men who count. You may be a telepath, sweetheart, but in this area I'm a clairvoyant. And all I have to do now is wait until you see the future the way I do."

IT WAS going to be even easier than he'd expected, he decided as he sat before the small shielded fire at the mouth of the cave Lesley called home. On a stick he was grilling some sausages he had brought with him—one of the things he had figured out in advance was that someone as squeamish as you'd imagine a telepath to be wouldn't eat the flesh of animals.

The point amused him and for a moment he dwelled

on the vivid recollection of a slaughterhouse he had once visited. From the rear of the cave a retching sound told him that the thought had had the effect he'd hoped for.

"There, there, baby," he called. "It's just one of these facts of life!"

"Bastard," she said.

"Sticks and stones, sticks and stones—"

Braden snuffed at the sausages and decided they were cooked through. He took slices of bread from a loaf he had brought and made a crude sandwich.

A pushover. A goddamn pushover. Why, he'd never imagined he would overcome her so easily. There she was, lying on the heap of torn blankets which served her for a bed, her wrists and ankles tied and she hadn't uttered a word of protest when he bound her. And that must simply be because when he thought about fetters and bondage something fierce was let loose on the lower levels of his mind, emitting a sort of raw animalistic violence that her sober detachment was vulnerable to. Faced with that kind of reaction all she could do was whimper and hold out her hands for the rope.

Oh, baby, what I'm going to do with you. . . .

The memory haunted him all the while he was munching his food. Belly satisfied, he lit a cigarette and relaxed into a contented reverie against the side wall of the cave. In some ways, even if nothing else came of what he had done, it was an achievement to have actualized his favorite fantasy. Tying up a girl with no clothes on, wholly and completely at his mercy—it was the other half of his private hell, the one in which he was the victim to be bound. And because he fundamentally resented the deprivation and subservience here implied, no matter how great a thrill it gave him, he yearned for the power that control over a mind-reader would bring him, as though that would set him free from the prison in which his tyrannical father and cynical mother had enclosed him. He remembered those Saturday night encounters when his parents called

him in to agree to the total of his week's offenses and to suffer without crying out the lashes that matched the number of them.

He caught himself suddenly. Thinking along those lines was dangerous. With an effort he wrenched his mind back to pleasanter ideas—he pictured a certain building in pre-Castro Havana, where a girl in high black boots with jingling spurs had passed the thong of a whip through her fingers and licked her lips lasciviously, ordering him to cringe toward her foot and kiss her toe. . . .

Behind him came a splashing sound and he jolted back to full awareness. He scrambled to his feet. It was no part of his plan to have Lesley foul the pile of blankets with vomit—he had dumped her there for the time being only. Since there was nothing else decently soft to sleep on he proposed to usurp the pile himself and let her sleep on the bare stone floor. A few nights of that and she would be well softened for him.

Although, of course, since she had shown herself to be so weak already. . . .

He caught up a brand from the fire and used it for a torch to light his way back into the shallow cave. As he had feared, the thoughts she had picked up from his mind had nauseated Lesley to the point of revulsion. Luckily she had missed the blankets.

He prodded her with his toe.

"Clear it up," he ordered.

Clasping her arms around her body, she looked up at him. "I—I'm *cold!*" she forced out between chattering teeth.

"I don't care," he rasped. "You're going to be a hell of a sight colder. Come on, clear it up before I make you lick it up."

Shuddering, awkward for the bonds on her wrists and the hobbles he had put around her ankles, she got to her feet.

"What—what with?"

"Should I know?" Braden shrugged. "You live here

in this pigsty. You must have something to mop messes up with."

"I guess I do," she said tiredly. "Okay, I'll see to it. But you'd better keep your mind on something else if you don't want it to happen again."

"It won't happen again," Braden grunted. "There won't be anything in your belly to bring up, not even water."

"What?"

"Not until you start doing as I say."

She stared at him in the red light of the brand he held. For a moment her mouth worked but no sound emerged. Then she seemed to crumble in on herself.

"Oh God . . . But I can't do it with my hands tied, can I?"

He started, suspicious of a trick. But her wrists were indeed too closely bound to let her use her hands. He found a ledge to rest his brand on and warily slacked the rope to a distance of a foot or so.

"That's enough," she sighed and headed for the mouth of the cave.

HE DASHED after her, thinking that, even if he himself would not have dared to face the steep hillside in the dark, she who had lived here for years on end might be willing to risk it to get away from him. But she stopped by the screen of piled rock hiding the cave mouth and took from behind it a plastic bucket he had seen earlier and a cheap broom with most of the bristles missing, which she must have bought in the general store of the town where he had heard news of her existence.

He relaxed, letting her go past him back into the cave. Not until he had seen her clear away the mess she had made like a perfect slave, however, did he let himself assume his former confidence.

Why, all I need to do to keep her on the leash is think about things she finds distasteful! I could weaken her past the point of resistance and enjoy myself at the same time. . . .

Memories leaped up, not only of the house of ill fame in Havana which he had once patronized, but of another in Los Angeles and another in New York and another and another in every city where his steadfast quest had taken him. A multiple blur of women in provocative scanties and high black leather boots wielding whips arose in the forefront of his mind.

"You wicked boy," Lesley said and raised the broom so that its shadow wavered across the rock wall like the flexible lash of a whip. "You wicked boy—you've sinned, haven't you? Go on, admit it!"

The tone was right, precisely that of his mother when she weekly called him in to face his father and the regular beatings he endured. The manner was right, the words were right—even the fact that the girl who spoke them was a decade younger than his mother and wore no clothes at all could not destroy their impact. From the lowest levels of Braden's mind welled the impulse to obey.

He fought it valiantly but she raised the broom, as once his mother had raised one when he tried to defy parental orders. He cowered down and—in the last instant of coherent thought left to him—realized the fearful truth: that to someone who could read minds not only his ambitions but his worst weaknesses were like an open book.

So that, in fact, it was he himself, through his desire to suffer pain and humiliation, who gave Lesley the power she would never otherwise have possessed—to bring the broom slamming down on the nape of his neck and drive him into unconsciousness.

WHEN SHE had overcome the repugnance occasioned by her reaching into Braden's mind and sharing the distorted instincts there, Lesley freed herself from her bonds and tied him securely with the same rope. Having made him into a kind of parcel, she set off awkwardly to negotiate the side of the hill.

It was a long slow job but she made it with dawn

purpling the sky, found his car where it had been left. She searched him for his keys, pushed him into the back seat and drove bumpily away.

Apparently without reason she stopped a couple of miles away among a ring of boulders and got out, leaving the engine running. She raised the hood and found the inlet of the oil supply. Carefully she scooped up sand and measured it into the pipe until the engine ground to a halt.

Then, just to make certain, she hunted for and found the draincock of the radiator, allowed the water to seep into the thirsty earth. She took Braden's own pocket knife and stabbed at each of the tires. Then she took a pencil from his pocket and wrote something on a scrap of paper.

He stirred and began to wake and she threw the paper and pencil blindly down on the seat near him and ran.

Much later that year a rambling prospecter found what he had found a dozen times before—a clean-picked human skeleton in the dry sand. He shook his head and muttered the usual "Poor fella" to his burro. A short distance further on he came across a car with its tires flat and the driver's door open and approached to see if it would give any clue to the identity of the dead man. But there was nothing except a scrap of paper lying on the seat with a few words scrawled on it in the sort of script one would expect from a poorly educated child.

Scratching his head, he read it aloud to the burro as if requesting an explanation.

"I don't care what happens to you here. My range is less than a thousand yards."

THE NO-WIN SPOTTED TIGER PLANET

By W. Macfarlane

While undergoing a learning experience inside the shell of a highly chronocentric human being, a non-chronocentric being from somewhere else solves the problems of transportation, urban sprawl, and air pollution. The result? He loses his cosmic sense of identity while we gain a whimsical romp through the science of diopiter ingaussing perpelators and the Magworth effect. Hold on to your hats, next stop is . . .

THE NO-WIN SPOTTED TIGER PLANET

WITH THE authority of experience, the Mohmu completed the interspecies transfer. He was projected from warm dark comfort into a bright noisy world of physical assault that made him take a breath into his new lungs and howl with shock. The displaced entity was lodged in his own body with full observation and no control, his ship was safely stationed a nanosecond in the past, and he was overwhelmed by sensory input. Any planetary investigator knows the best way to understand a species is to become one of them and this is what the Mohmu had done, a full identity transfer at the moment of birth.

The Mohmu are not chronocentric. Their physical being is essentially invulnerable. They raise their young in a mindless condition and their highest art is the design and imprint of intellect at bodily maturity. Programed as an investigator, with no imperatives of time,

Brad Symons functioned in all departments, cried in the night and studied his new world.

He grew older with all deliberate speed and care. When his father rented a cabin with an unvented gas heater the baby pushed a coat stand through a window to save the family from asphyxiation. When his mother cut her wrist and fainted he lay on a pressure point until his father returned. Later, when he found the steering arm of the old Chevvy cracked and he was too young to warn about it, he tugged away the log in front of a wheel and let the car roll into a tree.

He was an extraordinarily ordinary child though he was Bradnow, Brad-aboard-the-ship and a Mohmu, constantly amazed at intelligence in such a tentative and fragile form, naked to circumstance and subject to improbable tensions. He adapted to the pattern of this image-manipulating species and began to project goals for orientation, to ignore reality and dream the future to construct the future. It was a profound exercise of will to live in distorted time instead of the eternal now.

His parents were caught by a storm on a lake and drowned, and the boy, who had been an average student, settled seriously to work and won a scholarship to college. He graduated as a cultural anthropologist. He took his master's at Columbia and his paper on *Ritual, Taboo and Sexual Practice Among the Academic Hierarchy* became an underground classic. It illustrated his complete familiarity with the odd juxtapositions men call humor and it made a lower profile professionally desirable. He took a teaching job at Euphemia College in Tullataska, Tennessee.

According to a small group of Young Turks on the faculty, Euphemia was an outstanding example of the stagnant educational system—motivational fadeout, instruction like a clogged leach line from the septic tank of knowledge. Brad Symons thought the college admirable, a field where young animals could exercise themselves and even more, a rich source for his investigation of what he privately labeled idioznicroznies and co-

inkydinks. He had observed the hitherto unexampled foreshortening of time in man's history, but it was a coincidence (odds a million to one) that the idiosyncrasies of Joe Magworth (odds meaningless) should bear fruit at Euphemia.

Magworth said, "Okay, Brad, step into the field."

The other men, Beaird, Kramatz, Morgan and Dilwarden, said they observed a euphoric effect, just as if the sun were shining on your liver, just as if you were eighteen and it was the first warm day of summer in a red convertible and the girl had that unmistakable languid look in her eyes.

The Mohmu were beyond primative technology. Experimental physics was plywood, C-clamps and pipe, electric cable and junction boxes, equipment of painstaking complexity. The discipline had its necessary jargon and while Brad understood words like *check, plug her in* and *goddamn*, most of the conversation was "thermal inertial diodes steady," and "in-phase beam triads" doing as they ought.

He walked into the circle painted on the floor. He was wearing a plastic doughnut on his head, a wide belt with rods sticking out a foot from his waist, a hundred strings of macaroni running from the doughnut to the rods and down to the floor. The tubes were filled with Coca-Cola or chopped alfalfa and at the focus of the beams, the man disappeared. Brad knew this because he had seen Dilwarden vanish. Kramatz swung a yardstick through him and Dilwarden said he felt it as much as a flashlight beam.

"Get the hell away," said Magworth. The men stewed and fretted and checked the machinery and swore. Beaird got a Polaroid and they tried it again, and Brad got a look at himself as others saw him. All the spaghetti had vanished and there he stood like a brick-red statue done up in heat-shrink plastic.

"Anthropologists are always great bastards," said Joe Magworth.

Brad told him that physicists were Tinker-toy clowns and his mother had been frightened by an Erector set.

MAGWORTH STUMBLED into Brad's apartment the following Sunday, heavy-eyed and inattentive to the TV football game. Brad was fascinated by football as a microcosm of mankind with infinite variables in a framework and Magworth liked the ballet and beer aspects of the game. Today he was preoccupied.

"I don't understand it," he said.

"The pulling guard missed his block, that's what."

"No—damn it, Brad! I got J.B. Buckert to come in and he's a bigger man than you. He's a very conscientious guy and wanted to know why the lights were on at three this morning. He weighs two-forty and he vanished like that little beaker of beer you gave me."

"Have another beer."

"Right," said Magworth. "But you're a polka-dot tiger, dammit. Every other person checks out stripes. Trouble is, I'm not a geologist—maybe you've a different kind of rocks in your head—and I can't find the money to pay for a first-class examination. All the college clinic can do is tell me if you have athlete's foot or not."

Three months later money was no problem. Euphemia was suddenly a peer of the University of Tennessee instead of a shirt-tail relation, because of Magworth, the Magworth Effect and what happened at the demonstration.

J.B. Buckert was chief of the eight-man police force of Tullataska, dedicated to his job as peace officer. He was a graduate of Euphemia and often bent the law to favor the student, and when outsiders chose the college as a symbol of social repression and laid plans to raise hell, J.B. had early word on the proposal and took action. He kept a slush fund for worthy purposes and he financed a more particular application of the Magworth Effect.

What happened was called the Incident at Tullataska

Creek. It flowed through campus and subsequently became as well known as the Rubicon. The invasion was organized. The wire services had been notified, a TV crew from Nashville was in attendance and sympathizers showed up from places all over the map. The local students came to watch the sophisticated ways of the outer world and were caught up in the excitement.

Buckert timed his operation to the musical interludes. People flung themselves around and, with the ecological addicts present, it was not surprising when many of them embraced trees. The loudspeakers blasted at ninety-five decibels and few noticed the tree fanciers. The TV crew paid attention and their sequence of one earnest young leader presumably overcome by frenzy, wrapping both arms around a blue gum, was picked up by the networks. The lens zoomed in to see handcuffs miraculously appear around his wrists and that was the tipoff. With the leaders embracing trees, it wasn't much of a demonstration. All it did was change the course of history.

J.B. said, "No harm done. We turned over the gasoline and dynamite to the state police. We're lookin' for the fellas who poured molasses in the electric git-tars. Handcuffs around trees? Students funnin' is what I say. The fella who used the sheepshears on them people is also missin'. The crowd dispersed nice when the music stopped. No trouble a-tall."

Anthropologists keep journals as teenage girls keep dance programs. Brad Symons wrote: "Of course it couldn't stay a secret. One report found the modified heating suits in the police lockers—Buckert sent a cruiser to Nashville to buy them at a surplus store. Then the *Newsweek* legman caught Dilwarden and Beaird up a tree, removing the beam projectors. What cinched it was the freshman who covered the happening with a Jap job and calmly sold an eight-by-ten glossy to UP-INS, the one with the shears in mid-air, chopping off long curls."

MAGWORTH SAID, "Hide me. I locked myself in the bathroom, climbed out the window onto the shed roof, sneaked through the lilacs and got away. There were reporters and TV and guys from GM and Westinghouse and when I got over the back fence I heard sirens in front."

"Have a beer. Relax. It's about time for the TV special."

Magworth groaned and chuggalugged half a quart of beer.

A girl on TV said there was no excuse to smell like yourself when you could smell otherwise and Magworth chuggalugged the rest of the bottle. The screen went blank and then: *The Invisible Man.*

"Turn it off!" said Magworth. "What am I going to do?"

"Keep your cool and make out like a bandit. The Army and FBI and CIA will come around. You could try for a warm weather foundation like Dr. Salk. Sell out to the best bidder. One thing, can you detect the Magworth Effect?"

"Oh, sure, with a diopiter ingaussing perpelator. Buy one at any radio supply store."

"Write that down for me, Joe."

"Okay, and a simple indopitor degaussing violator nullifies it. Turn it on or off. That's how we externalized the cuffs. Shall I write that down, too?"

"Please do," said Brad Symons.

He spent the evening in the Department of Anthropology after the CIA won the treasure hunt and took Magworth under its wing. He mimeographed the information and addressed the folded-over sheets to the mayors of the thirty-eight largest cities as reported by the World Almanac, to every fourth company on *Fortune*'s 500 list and the rest to members of the House. As an anthropologist he deplored interfering with his study group, but as a Mohmu he thought he should balance things off.

Within six months the generation and nullification of the Magworth Effect were well understood. Brad Symons stayed in the center of the action because he was the one being on whom there was no effect. He had taken the precaution of mailing his flyers in a dozen little towns in another state and, after the publicity, complete disclosure was the policy of the government and he was the more or less official historian.

His report titled *Fear, Hysteria and the Zigzag Future* was a runaway best seller. This meant that a tenth of the population ever heard of it, a tenth of that number saw a copy and a tenth of those opened the book. He had the iconoclastic gall to reprint the headlines:

LAW AND ORDER RAMPANT!
"IMPOSSIBLE!" J. EDGAR HOOVER
TOTAL INVASION OF PRIVACY!
MAGGIE WIGGY SAYS FUZZ!
NATIONAL EMERGENCY
DECLARED!

They invalidated the cliché that it takes 80% as much information to predict the future as it does to achieve it; 99% was available and no one foresaw the world as it was to become.

Brad relegated Magworth's latest thoughts to Appendix I:

> Assuming that present technology depends on past research, then the incremental increase of technology may be expressed as
>
> $$dS = TSdt$$
>
> where S = the present level of knowledge
> T = the rate of increase of technology
> dt = the temporal increment

This simple first order differential equation may be solved with the result:

$$\frac{dS}{S} = Tdt$$

$$S = AeTt$$

Now if H = S, then:

$$^{oc}tech = \int_{O}^{L} (Ae^{Tt} - Ae^{Tt}\, o)dt$$

but if to = 0 and the constant A is assumed to be equal to unity, then:

$$^{oc}tech = \int_{O}^{L} (e^{Tt} - 1)dt$$

And it got worse for thirty solid pages.

While Senators cried panic and Tullataska doubled briefly in population from an influx of industrial and international spies and invisible men were blamed for everything from spilled milk to earthquakes, the electronics industry stamped out millions and millions of detectors and neutralizers. At first they were very much like dog whistles with no dog to call. The United States exported millions for distribution in other countries. With the magnificent human ability to forget the past, the Magworth Effect distressed almost no one by the end of the first year, though the handwriting was on the wall, the beam broadcaster had been made portable and the receptors were third generation as two-inch-wide belts.

WHEN BRAD Symons wore one he still looked like a shiny brick statue. Applications of the maggie effect proliferated while fundamental understanding was still at the chalk-and-blackboard stage, a situation like running north from the south rim of the Grand Canyon

blindfolded, because extrapolation projected more level desert. The Mohmu was thinking about this at the entrance of the Institute when Joe Magworth parked his car. Forty-six people got out.

"How do you like that?" asked Joe.

"That rips the rag off the bush," said Brad. "I can barely understand the idea that we're built of atoms miles apart like the solar system, so how many angels can you jam together on the point of a pin?"

"We figure two hundred thousand in the same square foot space would push the two hundred thousand and first a foot away. No problem."

"Are you still individual, discrete and alone with a hundred and ninety-nine thousand, nine hundred and ninety-nine people inside you and around you?"

"I'll agree it sounds cozy," said Magworth, "but nobody casts a shadow. Just like in the beginning, the sun still shines on your liver. A very happy feeling."

"I think today you bombed the transportation industry."

"That's the way the cookie crumbles," said Magworth with true scientific detachment.

Where ten planes had flown before, one flew now and it was very small. Commuter trains became the size of a delivery van. Cabs had nullifiers and so did every building, but elevators used the beam and little elevator space was needed. In the beginning, for all the fail-safes and backup systems, moderate disasters occurred. Nobody enjoyed the idea of sixty-three people materializing in one elevator and personal battery-powered beams worn in hats became popular for a while. With design improvements, a jet crashed after it sucked in a flock of Canadian geese over Fargo, North Dakota, and four hundred and thirty-eight people walked away from the scene of the accident.

To the surprise of all observers, stodgy Washington, D.C., took the next step and installed beam projectors covering the entire city. You could see people in shops and restaurants and hear the bee-murmur of the great

buildings, but the sidewalks were deserted. Visitors were issued receptors. Criminals were sentenced to visibility. With mandatory nullifier implants, they were the only ones who walked the streets. A timing device was set to the length of the sentence, coded to avoid tampering, and it worked well. Ostracism is a powerful force among social animals. Some cities took the opposite stance and mounted nullifiers in a spirit of independence, but they changed their position as the crime rate soared.

It was much like the process of electrification. Central station power generation was begun in 1882 and fifty years later there were still communities with oil and gas illumination. With the foreshortening of events, the almost total spread of the maggie effect took five years in the United States.

Brad Symons returned to Washington after four months in a holdout commune in New Mexico. He had studied visible towns as they went maggie and established the obvious: the sense of euphoria was so attractive it became habit-forming, as life itself is habit-forming in spite of multitudinous drawbacks like toothache and taxes.

THE MOHMU designed for investigation are remarkably stable, but with complete feedback from Brad-aboard-the-ship, Brad-now was hungry for the most human environment, the city. He thought the wide open spaces and mindless nature were great for freaks and this made the changes in Washington doubly shocking.

Truck traffic had dwindled. Private cars were almost absent. A few government vehicles were left. The nullifiers were off at the Institute and Magworth's office was empty. "Where is everybody!" Brad yelled.

"Hey, Brad." Magworth appeared in corporeality.

"What happened?"

"I see what you mean. Well, it's just better, is all. Solid bodies are great but they've got to be fed and they catch cold and you have to take them to doctors. I

think the field theory has got to include the idea that man gets what he wants. Now, I've done a little math on this—"

"Another time, Joe."

"He dreamed of flying and he flew. Dreaming of music for private occasions, he made a record player. Dreaming of the moon, he made a ladder long enough. You see what I mean?"

"No."

"Well, scratch an engineer and you find a man who knocks on wood. Wary of a hubris of the intellect, mankind is now wallowing in a passion of the spirit. Delightful. It's been indicated by magic and superstition and religion. Forget the mechanism that triggered the reaction, forget the intellectual origin, forget Euphemia and Tullataska Creek."

"What are you talking about? Where does it end?"

"It's one of the things so obvious it's unexamined, but it's characteristic as hunger or fear of falling. Mary Coleridge put part of it like this:

Egypt's might is tumbled down
Down a-down the deeps of thought;
Greece is fallen and Troy town,
Glorious Rome hath lost her crown,
Venice's pride is nought.
But the dreams their children dreamed
Fleeting, unsubstantial, vain,
Shadowy as the shadows seemed,
Airy nothing, as they deemed,
These remain.

"You weird people are down the tube," said the Mohmu.

"There's an inbuilt wish for transcendental emotional experience. That's the way the buzzard burps. That's the way it is, Brad."

"Turn off the projectors!"

"They're only necessary during the learning period, like training wheels on a bike. Right now it's the

midpoint of the process and they're still on while the rest of the people come to the same conclusion."

The Mohmu saw no point to continuing. "I've changed," he said. "Have a receptor handy?"

He put it on.

Brad Symons vanished. As far as the Mohmu could tell, safe and warm aboard the ship in his own body, living a nanosecond in the past had not been perceptible to the former Brad-aboard-the-ship.

Joe Magworth whistled. "Great. Another inbuilt is the belief that the mysteries are unending. You're an example. Wonderful. I'll have to think more about that."

He vanished.

The Mohmu considered another life on Earth. The planet was large and only the carnal, crass, materialistic cultures, the technically advanced countries, had gone maggie.

It was another of the multiple paradoxes. He felt a new sensation of sand under his own Mohmu hide, a dreadful itch toward chronocentricity, toward the unending, mysterious human experience. It was an abominable sensation.

He left horrible Earth for home in desperate search for help—renewed certainty—and faith in the massive accumulation of data. But first he put up a warning sign for unwary passersby in space, the first his invulnerable, ubiquitous race had ever bothered about:

TRANSITIONAL SPECIES MAY BE HARMFUL TO THE HEALTH

and he shut out the fear that he might be contaminated beyond curing, that his Earthly insights might be infectious to his own eternal gyroscopic genus.

ALLISON, CARMICHAEL AND TATTERSALL

By Stephen Tall

This story is one of space exploration. Don't look for heavy action in the usual sense. But you will find plenty of adventure as three men grapple with the unknown on its own terms. Stephen Tall writes with uncommon exultation in this chronicle of callistonauts ALLISON, CARMICHAEL AND TATTERSALL as they chart the ecosystem of the universe.

I

THEY WERE all of them weird, by proper standards: Allison, Carmichael and Tattersall. Oddballs. Starry-eyed nuts. The space program was the space program but you didn't have to leave the human race to be a part of it. So said their contemporaries, with sly and good-humored scorn.

How could they know that in the long list of special names in the history of space contemplation and exploration, names like Aristotle, Galileo, Einstein, Goddard, Shepherd, Lovell, Armstrong, Aldrin—none would be more lustrous, more worthy of memory than Allison, Carmichael and Tattersall?

Since the moon explorations, man had reached out. Mars was known. Four landings had been made on its bare and cratered crust and the hope of finding indigenous life and remnants of past civilizations had been sponged away by bleak fact. There was no life on Mars. Apparently there had never been. But it, too,

had served. Timonium power was first used on the Mars run—and the solar system opened. The stars still lay beyond. But an infant must learn to walk one step at a time. The next step, vast Jupiter, swung in its majestic orbit as always and now, with timonium, it was within reach.

The target was Callisto.

It had long been theorized that the giant planet might never be explored at first hand but that its big inner satellites were natural space stations, ready-built observatories for the studies that would have to be made before improving man moved on to the stars, out into the unknown systems that swung around other suns.

The term was Callistonaut. There were to be three of them; three men intelligent enough to grasp the intricate technologies that would implement the entire project. Three men who could live together tranquilly and at peace for the two years of the journey to Jupiter's great moon and return. Three men with competencies so special that location meant nothing to them. Three men who could work for days and weeks without thinking of their surroundings at all. Three men who could live happily without the human race.

And when the tests and competitions and complex analyses and expert opinions were finally structured and programed and fed into the computers the three Callistonauts, by margins so wide that it was no contest, were Allison, Carmichael and Tattersall.

Allison and Carmichael could play tick-tack-toe for literally days on end. They had a record of games that extended back to the first days of their space academy training. They had refined the game and complicated it but it was still tick-tack-toe.

Tattersall loved to watch ants. He could and did watch them from earliest dawn until they grew quiet in the evening chill. He was happiest when he had a day all to himself, a day in which he could watch ants.

It must not be inferred that these things were all they

could do. Naturally not. Carmichael was a space physicist-mathematician of such profundity that he thought—and sometimes spoke—in mathematical symbols. And his memory was legendary. Allison had designed the basic energy-detection devices with which the spaceship was equipped. He expected to work on them, to extend them, to test them, to use them for whatever purposes presented themselves during the two-year voyage.

Tattersall's concern was life. All kinds of life. Life interacting with life, life in whatever forms it could be imagined to exist and wherever it might possibly be found. Was there life on Jupiter? On Callisto? If there was, Allison would detect it, Tattersall would recognize and interpret it and Carmichael would reduce everything to formulae of unimaginable complexity and completeness and collaborate with the computers in deciding what they meant.

IN THE orbiting assembly factory stabilized thirty-one hundred miles above the Colorado Rockies the Callisto ship finally reached completion. Its interior, designed by the best minds in the international space program, was modified slightly by its occupants-to-be to include a comfortable game cubicle where tick-tack-toe, space chess and other games could be played. Adequate provision also was made for the housing of Tattersall's ant colonies, a number of which he planned to take along. The long artificial days, the weeks and months in deep space, would be ideal for ant-watching.

The ship had little personality. It was a metallic, glittering, featureless teardrop, the blunt end destined to nose first into uncharted, uninvaded space, the tapered trailing end well suited for the extruding of sensors, and for the location of ion exhausts from the strange new timonium engines. On one side of the front bulge was painted the insignia banner of the International Space Council, on the other glowed the Stars and Stripes. The Callistonauts approved of these. They were proper and

fitting. But the name *Natalie* across the front of the ship's blunt snout annoyed them all.

"That is ridiculous," Allison said. "Whose bright idea was that? Naming the ship is the spaceman's right. I wouldn't be comfortable invading deep space in a ship called *Natalie*. I don't even know a Natalie."

He had not been informed that Natalie was the name of the International Space Council President's favorite niece. It would have made no difference if he had known.

Tattersall strode on long legs around the front of the vessel, his magnetized boots snapping onto the metallic scaffolding at each step. He liked the lines of the teardrop.

"This is a good craft," said Tattersall. "She has a destiny. She will ride the oceans of space. She'll be blown along by the solar winds. Let's call her the *Albatross.*"

"I used to be pretty good with a brush," Carmichael said. "Probably I haven't lost my touch."

So he called a construction foreman, borrowed the equipment he needed and had himself lifted up to where he could go to work. A few minutes with an expunger, and *Natalie* was no more. Then neatly, in Old English lettering, he painted *Albatross* in glittering blue.

"Put a penetrator ray on that," he directed the workman. "Make it a part of the hull. If Natalie has to have her name on something, we'll call a mountain on Callisto Natalie."

"One on the back side," Allison amended.

Like Earth's moon, Callisto always keeps the same side toward its planet.

The Callistonauts thought nothing of this tweaking of the nose of Authority. In fact, they thought very little of Authority, period. As the first spacemen destined to pass the asteroid belt, to probe the far reaches of emptiness in which swung the Outer Planets, they knew they were special and thus entitled to a reasonable

amount of privilege. This they were not backward about assuming. The prompt handling of the name incident set the tone for the entire operation. ISC could finance, construct, plan and propose but when the chips were down it would be the Callistonauts, the men on the spot, Allison, Carmichael and Tattersall, who would dispose.

So no more was heard of Natalie. The *Albatross* was christened by breaking on its snout a bottle containing French champagne, Russian vodka, Japanese saki, Mexican tequila, Scotch whiskey and, at Tattersall's insistence, a small dollop of good bourbon from a little still known to him in the Tennessee hills. Four hundred million television sets showed the ceremony to the world, while announcers and commentators chattered in five hundred languages, plus any number of dialects and accents. The composite fluid from the broken bottle had no effect on the ship's hull, thus confirming a general impression. The *Albatross* was a sturdy craft.

There was a great deal of oratory. Dignitaries from all the countries that had contributed to any extent to ISC were ferried up from the planet's surface and occupied seats of honor on the great domed platform, looking down on the green and cloud-swathed Earth and out into the blue-black void of space. If they had contributed sizable amounts, they were on the program. The speeches went on for hours. They might have lasted longer had not the Callistonauts, growing bored, gotten up and walked out of the dome, crossed along the pressurized corridor and boarded the ship.

"A man can take just so much," Allison commented. "After all that hot air, they'll have to pump out the bubble."

"Live and let live," said Carmichael generously. "They're having fun. If they hadn't seen us walk out, they'd never have missed us."

"Pity," Allison said. "Still, I suppose we might sneak in a game or so while they're winding things up. We can say we're christening the game room."

They settled in, made themselves comfortable, and soon were lost in tick-tack-toe. Tattersall went to see about his ants.

THE PRE-LAUNCH activities came to an end at last. The Callistonauts went through the final checklist of seven thousand four hundred and two items with Earth Control, Allison and Tattersall using conventional lists, Carmichael doing the whole thing in his head. Then they posed for final pictures, battened the last hatch and the *Albatross* pushed gently away from the domes and platform and scaffolding of her orbiting birthplace and floated quietly, a mile or so from the crowded platform of watching VIPs. The crew strapped and fitted into their acceleration couches. Ignition lights burned. There was a soft whine, a faint blue mist diffusing at the tail of the teardrop, and then, to the wide-eyed watchers, nothing. The *Albatross* was in her element, riding the solar winds.

"There's not much point in piling up all those Gs at take-off," Carmichael remarked ten minutes later, as they unstrapped. "We could build speed slowly and get the same result."

"Makes your tummy unhappy, does it?" Tattersall grinned. He bounced his lanky form from one wall to the other of the observation-control room, finally steadied himself in midair but upside-down to his two companions, who still clung to their couches.

"Not really," Carmichael said, "though I've got more tummy to be unhappy than either of you." Carmichael was short, had a pink face and platinum hair and tended to be plump. "It's just that the fast take-off is an atavism. Like having a buggy-whip socket on a racing car."

"We can put that in the report," Allison suggested. "It's true enough and it's a good line." He rolled off his couch and floated free in the zero gravity.

They all spent a few minutes bounding about, enjoying weightlessness. They handled the situation expertly,

for each had had several moon runs and Allison had been a member of the last Mars expedition. They had their space legs. But probably what they were enjoying most was the knowledge that the wordy VIPs were receding into the distance at a comfortable fifty thousand miles an hour.

"Well, to work," Carmichael said. "Let's check out with Earth Control and verify what they know as well as we do. Once they're happy we can have a bite of something and then I'll feel we're in business."

"I'll do it," Tattersall offered. "After we pass the moon I've got a watch program to set up. Let me get my routine over first."

So he went through the seven thousand, four hundred and two item checklist with Earth Control, exchanged a couple of pleasantries and switched off audio contact. Everything green. Everything Go. Earth Control could monitor every system and activity on the craft, could activate back-up systems, could even detect need for and initiate repairs. As far as the responsibilities of the Callistonauts were concerned, the *Albatross* was as completely automatic as any space entity had ever been.

The one thing Earth Control could not monitor without the cooperation of the crew of the *Albatross* was conversation. And that probably was just as well.

Actually the *Albatross* was a luxury situation. Due to the launch from high Earth orbit and the marvelous efficiency of the timonium reactors, there were no practical restrictions on needed equipment, materials or space. The ship's calculated fuel need, for all situations and for two years, was just thirty-one pounds of timonium. And a three hundred per cent margin for unanticipated emergency was included in this.

A two-year supply of food bio-mass, in forms that each man found most palatable and perfectly maintained in fresh or living condition, was no great problem. In addition, a hydroponics room, which ran itself, provided everything from radishes to melons. And if both

of these were, for some highly unlikely reason, no longer available, the ship's organic recycling systems would still feed the Callistonauts. Not as enjoyably—but they would be nourished indefinitely. They wouldn't starve.

Each man had a small but comfortable stateroom. The workshop was the result of an inordinate amount of planning and designing and there was no reasonable equipment that could not be constructed in it. Raw materials were in adequate supply, including projected possible needed amounts of every element in pure form. In short, the Callisto run was more than a simple expedition to explore a sector of the Solar System. It was preparation and training for the stars.

AFTER TEN hours in space the Callistonauts were not only settled in, they felt more at home than they had felt for months. They had watched the moon drift by at a close four thousand miles and had received a *bon voyage* message from the dome at Tranquillity. They had had a meal, a rest period, and each had taken a first step on an activity that was particularly his own.

Tattersall had gotten his ant colonies properly installed and normally active. In the stress of take-off he had neglected to activate the rotation of the ant lab and had found each colony capsule an unhappy, leg-waving cloud of ant workers floating about aimlessly in the zero gravity or clinging together in violently agitated balls. There was considerable individual injury. With the establishment of normal one-G, the ants promptly resumed instinctive behavior and no permanent harm resulted from the oversight.

"In any ecosystem, damage to the individual is only a symptom," Tattersall mused as he watched his pets clear away the debris after the disaster. "If the species adjusts, the species persists."

Allison set up the first of a proposed series of screens designed to make visual the sophisticated winnowing of a matter-detecting device. This was simply a variation

of his energy-detecting and analyzing principle and he had high hopes for it. Trained on a space quadrant of known size, the sensors were designed to locate and eventually to record each material particle as it appeared in and traversed the area. Since these were of many kinds and values, the first screen showed a confusing kaleidoscope of streaks and clusters of light. But Allison sat and studied it happily.

Carmichael's concern was with the computers. There were three of them and each reinforced and extended the potential of its next smaller predecessor. Hence the first two actually digested and structured data for involved analysis by the third. They required no maintenance or adjustment but Carmichael faced them with problem after problem, all manner of probability speculations, hypotheses in a variety of frames and contexts. In his way he was quite as content as Allison or Tattersall.

They had the second meal together. This was not to be a pattern. None of them had the same metabolism, the same rest needs, the same work-period length preferences. The ship's maintenance was completely automatic. Its speed and guidance was one of the functions of the first computer and never required the collective attention of the Callistonauts. This second meal, therefore, was entirely social, before individual activity rhythms became established.

"REQUEST A conference," Tattersall said, after the eggs and bacon, toast and orange juice.

There was both California and Florida orange juice, to be fair. With the second cup of coffee they were leaning back in their chairs, relaxing. The ship had been given a one-G spin, so normal eating procedure was possible.

"I'm available," Carmichael said, stirring his coffee. As his well-nourished build indicated, he took both sugar and cream. Allison liked cream only, while Tattersall drank his black.

"Fire away," said Allison.

Tattersall sipped tentatively at his steaming cup.

"I'm concerned," he said, "with all that empty space out there."

"Aren't we all?" Carmichael asked.

"A partial misstatement," Allison pointed out. "It's space, of course, but it's not entirely empty. Matter is simply more widely scattered. Everything's relative."

"This we know," Tattersall conceded. "I used conventional phrasing. My concern is this: In every life situation that I'm aware of, each living thing has a minimum space requirement. It also must have a consistent energy source and sufficient matter for a corporeal entity. The availability of these basics results in persistence of life form. No sweat?"

"Ecology I," Carmichael said. "Carry on."

"In any ecosystem," Tattersall lectured, "given the energy and the matter in usable form, the competition is for space. Hence Earth, with its carbon-based life molecules adjusted to a free-oxygen atmosphere and able to aggregate into complex life forms, is limited in population numbers only by the space it can provide."

"Obvious, but relevant to what? This is out of my field," commented Allison.

"I'll get to you," Tattersall said. "I think you're important. But first, more kindergarten. Why isn't there life on Earth's moon? On Mars?"

"Atmosphere, naturally," Allison said. "Lacking that, the other missing basics, if any, make no difference. No oxygen, no life."

"As we know it," Tattersall added. "There's space, though. Just no way to make a usable energy flow available to complex, replicating molecules. Q.E.D."

"So what's the question?" asked Carmichael.

"There could be living entities on Mars, perhaps," went on Tattersall, "if they had other than a carbon-based molecular organization and another way of garnering the needed energy supply. We don't believe they're there, for such 'living things,' if you will, would

be likely to approach densities comparable to the substrate and would hence be detectable. We could see 'em, weigh 'em, count 'em, take their pictures. And the available space for such forms, the surface space of the planet, would be negligible compared to all this lovely nothing we can see out the view ports. In other words, if life could get its basic requirements of matter and energy in some other fashion, why should it aggregate around any miserable little dense matter complex? Its other need is space. And there's space. Endless, ageless distances of it."

"You're beginning to interest me," Allison said. "Tie it up."

"When I saw my ants tumbling about in zero gravity, totally unable to adjust to the lack of the attraction of their bodies to a dense substrate, I began to think. If there were no large, appreciable aggregations of matter in the universe, would there be no life? If matter and energies are diffuse, are they any less there? That space out there is older than any planet, older than any sun. Why couldn't it also be the oldest life space, the ancestral biosphere?"

Carmichael bounced out of his chair, took quick strides up and down the small dining room.

"Beautiful," he said. "Logical, too. I'll compute some general probabilities, then dig into the likelihood of other living molecular combinations, using known atomic structure, elemental affinities and behavior, for data. It could take me a while."

"We're twelve hours from Earth," Allison pointed out. "We're concerned, among other things, with the possible life on Jupiter, on Callisto, and the rest of the Jovian complex as opportunity offers. Are you trying to reason that life out of existence before we even get there?"

Tattersall grinned.

"Not at all," he said. "You weren't listening. The probabilities are the same as they were before I said a word. And I wasn't saying that the possibilities of life

on those aggregates are particularly remote. Carmichael can do some playing with that. I was reasoning after the fact with the moon and Mars. If there's life there, nothing we've yet devised can detect it."

He paused and his long, homely, Lincolnesque face looked blankly into distance.

"No," he continued, "what I'm really concerned with is the space between here and there. Is it waste, nonusable space as far as life is concerned? Since the beginning of time, whatever that means, have no replicating, behaving masses ever made use of all that apparent emptiness? As an ecologist, suddenly I don't believe it."

He eyed Allison's classic profile, so different from his own.

"You've got sensors out," he said. "You're probing that same space with equipment so special I'll never have sense enough to understand it. Do I challenge you?"

"You know, you do," Allison said. "I'm surveying space because it's full, not because it's empty. You're hypothesizing concerning what it may possibly be full of."

Tattersall unfolded his long form.

"As far as I'm concerned, conference is over," he said. "I've got my money's worth."

II

TATTERSALL KNEW he'd get his money's worth in more than discussion. The organization, or rather the complete lack of it, of the *Albatross* personnel practically guaranteed that. He had planted an idea. Each Callistonaut had his own competencies, his own special areas of concern. He had no obligatory tasks, no restrictions on how he should or should not spend his time. No man had authority, save over his own activities. It shouldn't have worked, men being men. But it did.

For three activity spans, roughly three Earth days,

the men barely noticed each other. Carmichael slept twice, Allison had his eight hours three times, while Tattersall had four brief naps. Carmichael had roast beef, lamb chops, a huge pizza and lots of ice cream during his waking hours, Allison had run heavily to vegetables and eggs and had visited the hydroponics room twice for fresh leafy greens. He also took setting-up exercises after each sleep. Tattersall wasn't hungry, so he knew he must have eaten now and then, but he couldn't remember what.

The spaceship was tooling along at the agreed-on fifty thousand miles an hour. Earth Control monitored but made no adjustments, since none were needed. For the Callistonauts the ship was home, transportation and undisturbed lab space. That was as near Utopia as they ever expected to come.

Having watched ants and speculated on hypothetical space populations for his three days, Tattersall mentally came up for air. He wondered if Allison's sensors were picking up anything new and different. Carmichael may have pin-pointed some new molecular affinities with possible life potential. He found them in the game cubicle, just launching on a session of tick-tack-toe.

"I don't mean to intrude," he apologized. "Just curious about the sensors."

"We've only just begun the game," Allison said. "Afraid I've got nothing you can use yet." His handsome face brightened. "One thing, though. I've made the solar wind visible. The proton flow shows nicely. Carmichael is going to calculate concentration and spacing after we relax a little. I think I've got enough for him to work with."

"Only subatomic particles?" Tattersall was disappointed.

"As of now," Allison said. "I think I've figured out how to broaden the settings, though. After all, it's just radar."

"Plus," said Carmichael.

"Plus," Allison agreed. "Go in the lab and take a look. The screen's on."

Tattersall left them to their game. Since he had been invited, he had no hesitancy in seating himself before the big screen and watching the even streams of tiny blips move endlessly across it.

If he can broaden the settings, he mused, *we might learn something. Visualizing a known entity is just game playing. But some provision for sensing all matter in a section of space simultaneously—now that would be progress!*

He decided he was hungry, so he punched for eggs and bacon and Florida orange juice. He'd had California the last time he recalled eating, but couldn't detect any difference. After plenty of black coffee he was suddenly ready to sleep, which he did for twelve hours.

"I've adjusted the sensors," Allison told him when they happened to meet in the control room a couple of days later. "I get the gross space trash now, meteors and the like, and some gas clouds, mostly hydrogen and helium. Nothing I didn't know to be there but I love to be able to see them."

"Sounds good," said Tattersall. He grinned as he added: "I've just had a gentle scolding from Earth Control. They've been trying to talk to us for two days. They seem to think someone should be available for contact at all times."

"Why?" asked Allison.

"They didn't say," said Tattersall. "May I see the screen?"

The dark surface was different now, with blips large and small, some in regular patterns and many jumbled in no detectable arrangement.

"I've raised my sights," Allison explained. "Nothing subatomic showing now. Everything you see is at least molecular in size. But the variety is so great the picture's not very analyzable. Carmichael put counters on some of the commoner items but it soon was evident what they were—so he lost interest."

"Blips the same size don't behave alike," Tattersall pointed out. Long experience watching details of ant activity had sharpened his awareness of minutiae. "If there were some easy way to tell them apart, your counting could be done on a much enlarged scale."

"How about color?" Allison suggested. "There's a spectroscopic arrangement I might make that would, I hope, distinguish. If I can pick it up, putting the color on the screen would be a cinch."

HE WENT back to the ants. But he didn't have his usual concentration. He found his mind wandering back to Allison's screen with its endless variety and fluctuating concentrations and patterns of little flashes of light. He wondered if closer observation, the kind a student of limited ecosystems could make, would extract any further profit from Allison's detection skills. He watched ants for a day, then gave up.

Allison had been busy. Not only had he changed and modified the emphases of his detectors but he had set up another screen, one that occupied almost one entire wall of the little lab. And it was a marvel of colored blips and clusters of lights, moving and whirling and flowing in dozens of simultaneous patterns.

"This one gives perspective," Allison explained. "The scale is smaller, the area much larger. It is concerned only with molecular clusters, which makes the situation less complex. Any questionable area can be examined in subatomic detail by the more refined sets of sensors which utilize the smaller screen."

"High and low power." Tattersall grinned. "That's as far as I can follow you. But the movement on the big screen is practically hypnotic, now you've got color. Mind if I watch a while?"

Allison waved a hand.

"Feel free," he said. "Watch 'em both. Have a ball. I think I've revealed all the matter that's out there, but so what? I make no organized sense out of what I see."

"There's order," Tattersall said. "That's apparent."

"To you, maybe," Allison said.

"Ye-es," Tattersall agreed. "Maybe to me. That's why I'd better look on."

He spent two Earth days looking on. For a while he and Allison talked but gradually each withdrew into his own area of concern. Allison ever more preoccupied with the intricacies of his sensor complexes, Tattersall just watching—watching. Even the ants had never been like this.

Carmichael brought them back to general awareness.

"Earth Control is in an uproar," he reported.

"Ah," Tattersall said. "We weren't available for verbal communication again. I guess we'll have to watch it."

"Worse. They say we're losing fuel."

"How?" Allison reluctantly left his sensor controls. "We're not under drive. No maintenance systems are malfunctioning. We'd have had the alarm."

"They know how," Carmichael said, "but not why."

"Let's start with how," Tattersall suggested.

"You know the timonium disintegration pattern. The only residue is ionized krypton. When this exceeds the pressure determined as optimum in the bleed-off chamber, the krypton ions are released as a trickle and the lowered pressure in the chamber initiates more timonium breakdown. The energy so derived is stored in the battery banks. Lowering of their charges can also trigger more fuel utilization."

"There have been no excess energy needs in the systems?"

"None. Utilization is exactly as predetermined."

"So?"

"Krypton ions are being drawn from the bleed-off chamber," Carmichael reported gravely. "I didn't believe it—but I programed all the data and Computer Three says the same thing."

"How fast?" Allison inquired.

"Appreciable," Carmichael said. "We couldn't stand

it for too long. We've lost almost two ounces of timonium."

"Where's the energy going? Two ounces of timonium would take our happy home here halfway to the asteroids."

"The battery banks can't overcharge, as you know. So the excess energy is being released as provided for in Emergency Pattern A. We've been trailing a streamer of light like a nova. We can be seen on Earth."

"Man, oh, man," Tattersall murmured. "What was that again about anticipating everything?"

"Even anticipation is based on data," Carmichael said. "We had no basis for anticipating this."

"Evidently not. We've got to solve it, though. Pronto. What's happening to the krypton?"

"That," Carmichael said, "is the question they pay off on."

THE SPACESHIP *Albatross* hurtled on toward the asteroids, all its systems doing their jobs normally, the habitat of the Callistonauts still exactly as it had been planned. But a fantastic cone of waste light energy flared out behind it.

Then, without warning or apparent reason, the krypton trickle reduced to expected volume and slowly the light died.

"You've lost your tail," Earth Control reported. "Your fuel is now normal and there is no energy loss. We can't detect malfunction or change of rate of anything on the ship. You seem to have a problem we can't help you with—but there isn't at this moment any evidence of its existence. You are completely Go, without any reservations."

"We're out here to learn." Carmichael was at the microphone. "Maybe we were already getting a little dull. You'll be happier, though. There'll be a man on duty in Control until we hatch this egg. So you can have a chat with us anytime."

"Nice of you," said Earth Control.

Back in Allison's lab, Tattersall wondered aloud.

"Why," he asked, "didn't your sensors pick up all that light? We seem to have been the last to know."

Allison showed his even teeth.

"I can imagine the talk. The answer is obvious. We're not adjusted for so-called pure energy. We were looking at matter. The small screen can show the krypton trickle, though. Watch."

In a moment the trailing, wavering series of blips showed on the small screen. Each spread, grew dim, then vanished beyond the focus of the sensors.

Tattersall sat and studied them.

After an hour he said, "Could you readjust the large screen to include particles this small? How about color?"

"Might do."

Allison worked, the big screen panorama shifted. Tattersall watched with an inhuman, endless patience. Finally the pattern of the krypton trickle on the small screen duplicated itself in the corner of the larger as a faint series of purple dots. And Tattersall gave the display his fixed, fascinated attention. At last he sank back with a sigh.

"There's more krypton in the environment out there," he observed. "Not ionized, though. We aren't making the only contribution. Where else would it come from?"

"No idea. It's normally inert, of course. Only something unusual, as timonium disintegration, can produce it in ionized form."

"The purple is due to it," Tattersall pointed out. "Change the larger screen to molecular aggregates again. Give me a smaller scale, a wider area, more perspective."

He seemed unaware that he was giving an order. He was talking to Allison, but Allison knew that as a person he did not at that moment exist. He was only an extension of Tattersall's thinking, a data-gathering

device. He grinned with appreciation as he made the requested adjustments.

"Ah-h!" The ant-watcher's long form settled back in his chair. It was his last word for six hours.

When he was convinced that Tattersall had retired into a thought world of his own, Allison left him. Carmichael, in the computer room, was willing to be disturbed. They discussed the fuel loss problem; Tattersall's preoccupation with the detection screens; the reasonableness of Earth Control's insistence on continually available voice communication. Finally they gravitated to the game cubicle and launched a new tick-tack-toe series, which they agreed would continue, with interruptions for essentials like work, rest and food, until they passed the first asteroid. The winner at this point would be officially designated as champion of the Inner Planets.

A WEEK later all was still well. Mars now loomed larger in the viewports than Earth. There had been no resumption of the fuel loss. Earth Control was almost happy, for voice communication with the *Albatross* had been scheduled for specific time slots and so far every one had been met. Actually Carmichael and Allison had simplified this situation by installing a brilliantly flashing attention light, an alarm buzzer and a microphone in the game cubicle. They could thus conform to the schedule with minimum distraction from the games. They did, however, firmly negate the one activity that would have filled the cup of Earth Control to overflowing. They steadily refused to do public broadcasts.

"We've passed this stage years ago," Carmichael summed it up with finality. "We're the Callistonauts, not show business personalities. We explore. We collect data. We do not entertain."

And from this point of view they would not budge.

They did not forget about Tattersall but they respected his privacy. Apparently he spent most of the week

in the chair before Allison's screens but he was seen several times in the corridors. He probably ate and no doubt napped in the chair. The last time Allison checked his equipment, Tattersall was busily making line sketches one after another, using a small lap board. Allison was curious but he waited. Tattersall would doubtless report eventually.

And he did.

He appeared at the game cubicle door just after an Earth Control voice check. Allison and Carmichael were between games.

"Request a conference," Tattersall said.

His fellow Callistonauts looked him over.

"When did you eat last?" Allison inquired. "You do look seedy."

"Why—" Tattersall paused and thought. "I don't know. Must have, though. I don't feel weak."

"That's not the way I tell." Carmichael patted his growing paunch. "Why don't we have a meal while we confer?"

He got no negatives, so they shifted to the dining area.

"I like breakfasts best," Tattersall remarked and punched for scrambled eggs, bacon, toast and orange juice. The last item wouldn't deliver until he specified, so he selected California, at random.

"Dinner time for me," Carmichael said and had a steak and trimmings.

"I'll just have a green salad," Allison decided. "I'm over on my protein intake."

"How can you remember?" Tattersall sounded envious of this remarkable ability.

He expected no answer to his question and got none. He sighed.

"Now," Carmichael said, with the expansiveness that a good steak induced, "what's the conference about?"

They all had coffee and were leaning back, more relaxed than anyone on Earth would have believed possible.

Tattersall had brought a small sheaf of his sketches, which he now began to shuffle.

"The topic is appropriate," he said. "Food." He looked considerably better after his breakfast, which, once his attention had been called to it, he had obviously enjoyed. He patted the sketches.

"Food chains, I suppose, would be more specific. I'm well on my way to working out several simple ones."

"You haven't watched ants for a week," Allison pointed out. "You've been living in front of my matter screens. No other life there, I think."

"That's why we're meeting," Tattersall said. "There is."

He slouched in his chair, drank coffee and shuffled the sketch papers.

"You remember my hypothesis," he went on. "You listened, you liked it, it made sense, but you didn't really believe it. Carmichael played around with possible atomic affinities. Allison surveyed the space we're going through but neither of you were thinking in life terms. I was."

He held up a sketch.

"What would you say this is?" he asked.

Allison and Carmichael examined it closely, passed it from hand to hand.

"Well?" prodded Tattersall.

"There isn't a kindergarten within thirty million miles," Carmichael said, "so you must have done that yourself. But as art it doesn't rank high."

Tattersall grinned.

"As a diagram, it's better. That is the commonest matter aggregate in the space around us. Those seven interlinked clusters occur in exactly that relationship. They are, compared to other arrangements I've isolated, quite small, and they exist in countless millions. They're the predominant unit on your big screen, Allison."

He waited and finally Allison said, "Carry on! Spin it out! You've got a repeating pattern and how you

picked it out I don't know—but we were sure that there would be lots of similar units. Where's the life?"

"That item you're looking at," Tattersall said impressively, "is what I've tentatively called a diatom. A space diatom. It can replicate itself and I predict that it'll be found to be energy-rich. How it gets the energy, how it holds it, I don't know. Probably one of you will tell me. But there's a space plankton out there and that's the basic form in it."

III

TO THE Callistonauts any point of view, any datum, was considered on its merits. That was among the reasons they had been chosen. So Allison and Carmichael didn't laugh. They thought.

"Diatoms are eaten," Carmichael said. "They form the food base of many larger forms. Does something eat those?"

Tattersall shuffled, handed over several sketches.

"Those eat them."

"The art's no better," Allison commented. "The idea, though, is fascinating. These are bigger, naturally."

"The scale's indicated on each," said Tattersall. "I've used the diatom as the basic size unit."

"You've measured?" Carmichael seized on an interest.

"Actually, no. Everything's relative. Direct comparison. I was depending on you to measure the diatom for me. If I were guessing, I'd say well under a hundred yards in greatest dimension."

"Then the larger forms are miles long?"

"Consider how diffuse they are. Hundreds of miles is more likely. There's plenty of space."

The Callistonauts sat silently, thinking. Finally, Allison: "I'm glad Earth Control isn't listening," he said. "They'd abort the mission and haul us back to be

tucked safely away in padded quarters. Have you lengthened the food chain?"

Tattersall held out another sketch.

"This is really big and incredibly fast. On your screen it looks like a boat outlined with colored lights plowing along in a dark ocean. In its path all these other units disintegrate. I'd say it is sort of a generalized carnivore."

"Abundant?"

"No, quite rare. Only occasionally more than one on the screen at a time. I haven't been able to diagram it well. They're always far off in the distance."

"Afraid of little old *Albatross?"* scoffed Carmichael. "Why, it's not much bigger than a diatom!"

"I don't know why," Tattersall said patiently. "I only know I haven't had one very close."

Allison stood up abruptly.

"Let's look. I'd almost forgotten that we weren't listening to a fairy tale. You've only had the screen at one adjustment. You haven't scratched the possibilities of those sensor banks."

It took time. But they were fed, rested and challenged. Once Tattersall was able to show them the diatom, the rest was easy. And when a diatom, brought up close and carefully tracked, divided while they watched, they finally had no remaining doubts. That empty space in the view ports, all that endless distance, actually teemed with life. In one week of dedicated staring at a screen, an ant-watcher had given a new meaning to space biology.

MARS FINALLY lay behind them. Ahead the first of the asteroids swam into the view ports as tiny, twinkling dots of light. But they went almost unnoticed. At the screens Allison probed, Carmichael measured and calculated abundance and distribution, Tattersall read organization into new light clusters and sketched new life forms. And once again Earth Control had trouble mak-

ing voice contact. The crew of the *Albatross* had no time for routine. It was working.

Occasionally Carmichael remembered and checked the control room for ominous signs. One day he found them. The entire fuel-use panel glittered with red lights and Earth Control was making frantic signals. Carmichael brought them in.

"You're losing fuel," Earth Control reported. The voice sounded resigned. "Situation exactly as before. You've broken down an extra ounce and a half of timonium and your waste light cone has obliterated our view of Mars. Please check and report."

"You have every indicator we have," Carmichael reminded Earth. "Let's compare each checklist."

He started to repeat them from memory as was his custom, then stopped.

"Wait," he directed. "There's one thing I can do. I'll call you in an hour. Out."

A few crisp sentences oriented Allison and Tattersall. Allison swung the focus of his sensor banks toward the rear of the space craft, adjusted for subatomic particles and, where he had earlier been able to demonstrate the trickle of krypton ions, a steady purple stream now flowed across the screen. Allison increased the focal depth, watched the ions spread, swiftly cluster with other, different particles, and form large, shadowy blue aggregates. These thinned out with ever-increasing distance, arranged themselves in widespread patterns with aggregates glowing yellow and pink and green. And while the men looked, the krypton flow slowed to a trickle. Allison worked rapidly to decrease his magnification to the level of molecular clusters. The eyes of the watchers, now adjusted to the outlines of diaphanous space creatures, saw a form of unbelievable vastness slowly drop astern.

"Smallest scale, deepest focus," urged Tattersall.

It was enough.

The great shape, faintly limned with electron dis-

charge, swung sidewise, paralleled the course of the *Albatross* and kept pace.

It seemed to loom but Carmichael, calculating, said, "Six million miles, give or take a few, to the nearer edge. One hundred sixty thousand miles long. I think it's aware of us."

"It should be," Tattersall said quietly. "It swallowed us."

Allison and Carmichael viewed their lanky coworker with some admiration. This was objectivity, plus. Tattersall was not impressed by the incredibility of his statement. He simply knew that it was so.

"We've been immersed in Galactic gastric juice?" Carmichael was not jeering.

"NOT EXACTLY," said Tattersall. As a matter complex it's not likely that the ship is within its frame of reference at all. We're too dense, like a meteor, or an asteroid. No, the life form responded to what it could detect and utilize."

"The krypton trickle!" Allison exclaimed.

"Exactly. We could see the ions form complexes, form molecules. Krypton is one of its nutrients, one of its 'tissue' components. Probably in the environment of that entity out there such dainties as our fuel residue are hard to come by."

They sat and studied the screen showing the scarcely visible but still obvious monster undulating majestically along, the clouds of lesser forms boiling around it and swirling and churning in its wake.

"Leviathan." Allison spoke the name with feeling. "Trite, but all I can think of. At one hundred sixty thousand miles long, gentlemen, that is one big varmint!"

Carmichael said, "We're impressed by dimension, not mass. I would guess that if old Leviathan were concentrated to our density he'd be about the size of a chihuahua."

"Whereas you," Tattersall picked it up, "if you were

diluted to his—" he eyed the Carmichael paunch—"would probably extend out beyond the orbit of Saturn."

"An exaggeration," Carmichael said placidly. "But it does illustrate the point."

They all grinned. As would be expected, each had an immense feeling of satisfaction, of well-being.

"We have opened a door," Allison said. "We have two immediate problems, though. One, what can we tell Earth Control? And two, how are we going to make old Leviathan keep his bill out of our fuel supply? Even if we could afford to feed him, which we can't, he may have friends."

"Probably has," Carmichael agreed. "But Earth Control first. I promised to call them in an hour. That was three hours ago."

"Space exploration is an unconventional activity," Tattersall said. "They'll just have to realize that."

Both matters were discussed at length. To Carmichael, as probably the best contact man of the three, was finally delegated the job of placating Earth Control.

"Snow them," Allison urged. "Tell them how hard we're working on the problem. Don't be handicapped by the truth. They wouldn't believe it anyway."

PERHAPS IT was due to the validity of the complex series of analyses by which the Callistonauts were chosen. Accidental compatibility of personalities could have been responsible. The concrete occurrence of the fuel drain may have contributed. Or maybe it was just plain blind luck. But by the time the *Albatross* went plunging into the asteroid belt three brilliant, eccentric individuals had coalesced into a team—the fabulous team your space history records: Allison, Carmichael and Tattersall.

The preoccupation of each with his own concerns gradually disappeared. They had problems in common, problems toward the solutions of which each could

make unique contributions. The ants lived their lives almost without supervision. There was little time for tick-tack-toe.

The practical situations among the asteroids kept them for a time from the diffuse matter screens. The first computer was constantly activating avoidance patterns and had reduced the finite speed of the vessel by half. The tiny planets were continually in sight. Meteor nets seined space around the space ship. Cameras recorded on miles of microtape and the telescopes probed without ceasing.

All these activities and maneuvers required energy.

"Dodging and recording all this flying real estate," Tattersall said, "is increasing our krypton trickle. What happens when you throw bread out the back of the boat?"

"You get followed," Allison said promptly. "Everything from gulls to sharks. Let's look."

The space biome seemed unaffected by the many little islands of dense matter. Plankton swarmed. The diatoms, and several forms much like them, jogged across the colored matter in endless profusion. Larger entities darted through them, scooping them up, yet seeming to have no effect on their numbers. And off in the distance, in his usual location off the port bow, Leviathan wallowed along with grotesque ease.

Allison changed the orientation of his sensors, surveying space in every direction. There were new forms, just as there had been every observation session. He looked most carefully in the sector to the rear of the *Albatross*. Far back in the space wake, leisurely zigzagging, a foreshortened hulk of fantastic size came on steadily.

"Another Leviathan type," whispered Tattersall.

"He's gleaning," Allison said. "He doesn't know where the stuff is originating."

"When he catches us he'll sponge a free meal. Goodbye two more ounces of timonium!"

"Suppose Leviathan detects him? There's no reason

why the territorial imperative can't pertain out here, is there? This is Leviathan's bailiwick. Why shouldn't he defend it? With his size he needs a really big territory."

Tattersall sighed happily.

"This beats ants four ways from Sunday," he said.

"Don't sell 'em short," Carmichael advised. "You trained on ants."

WITHIN AN HOUR the vast bulk of Leviathan II filled the color screen and overwhelmed it. The familiar outlines of the many known space forms gave way to alien groups and smudges, swirling and roiling in new and different patterns.

"We're inside," Tattersall pronounced. "He has swallowed us."

Allison pinched himself.

"I don't feel any different."

"Look at the krypton trickle. I'll bet it's a river."

Allison adjusted the finer sensor banks. The purple stream rippled and pulsed.

"Our waste light cone is bugging Earth again but don't contact 'em. Let 'em wait. How can we get this thing off us? Or how can we get out? It may have a bigger appetite than Leviathan the First has shown. This could get serious."

"Look at the screen!" Carmichael exclaimed.

The patterns were suddenly familiar again. Diatoms, space amoebae, other plankton and the many forms that fed on them and on each other, all were back—but in a state of wild disorder.

"Smallest scale, deepest focus," Tattersall urged breathlessly.

Allison worked.

Far in the distance two vast forms swung around each other in a swift and sinuous dance, flashing across millions of miles of space as they feinted and parried like fighting porpoises. They came together with impact that seemed to blend their diaphanous outlines, then bounded away with forms unimpaired.

"Sic 'im, Leviathan!" Carmichael whooped. "You can handle him! You've trained on the best krypton!"

It was a brief battle. One monster made a wide sweep—then, instead of closing the circle, it kept on going. In minutes it was out of range, completely undetectable.

"But who won?" Allison asked plaintively. "They looked exactly alike."

"Doesn't really matter," said Tattersall soothingly, "but if it'll make you feel better, that's our old friend out there. A dog generally wins the fights in his own yard. And look where he's positioning himself."

The huge outline was again in convoy position, plunging along far off the port bow, pacing without effort the twenty-five-thousand-mile-an-hour speed of the *Albatross.*

"He's not about to be ousted," Tattersall said. "He knows we give krypton ions."

"Maybe I'll grant that." Carmichael looked only mildly dubious. "He's still a problem, isn't he? He won't be content to sniff the fragrance. He'll be back for another feed. And another. And another. He keeps off others—but we can't afford him."

"I've been thinking," Allison said slowly. "If he can be attracted, it follows that he can be repelled. Rats learn from mild electric shocks. Dogs won't eat food with pepper. You follow?"

"You want to teach him *no-no?* I'm sympathetic. But how?"

"Feed him something he doesn't like."

Tattersall chuckled.

"You have an idea," he said, "but you've created another problem. What doesn't he like?"

"You've watched the life forms," Allison pointed out. "You discovered them, discovered their behavior. But I've looked more closely at their compositions. I've identified a number of atomic and subatomic particles out there. And many that are common to large aggregates, to suns and planets and asteroids, are missing in

open space. We've got pure elements. Let's feed him a small dose of one not a part of his structure or his environment."

"Oxygen?" Tattersall's eyes gleamed. "It's active, we can release it in minute amounts and it might make a nice paradoxical irritant. No life we've previously known can exist without it. But I seem to remember that it isn't found in practical quantities in space."

FOR THE first time the crew of the *Albatross* grew impatient as it waited. It had baited a trap and the quarry would not come in. Between stints in the control room Allison and Carmichael played space chess but neither cared who won. Tattersall alternated between his ants and Allison's screen, where Leviathan rolled tranquilly along his chosen track, day after Earth day.

"Krypton must just be dessert," Tattersall decided. "He really doesn't need us."

But their monster-watch came to an end, as it had to. Tattersall saw him as he peeled off, swung in a million-mile circle and dropped in behind the *Albatross,* following up the spreading ions of the krypton trickle. Allison and Carmichael left a game unfinished.

Leviathan came on steadily. The space life boiled away from his snout, then the screen no longer showed it as he engulfed the spaceship and speeded up the trickle of the appetizing krypton.

"We're inside," exclaimed Allison.

"Here goes," Carmichael said and pressed a release button.

The tiny jet of oxygen would not have sustained a mouse for a minute but the colors on the screen rioted. In an instant the swarming plankton were visible again, roiled and lashed as by a typhoon. Allison worked swiftly, deepening the focus of the sensor banks.

Far off to the sunside of the little ship Leviathan flung himself about with frantic abandon, swapping ends like a bucking horse, probably creating untold

havoc among the packed shoals of lesser life. Three pairs of human eyes stared in fascination.

"Look well, gentlemen," Carmichael said in a hushed tone. "Never, I think, will you see a more colossal case of celestial belly-ache."

An asteroid, one of the largest they had recorded, lay directly in the path of the plunging, writhing monster. The little world, its sunside glittering, was not obscured and had no effect as it drifted through the diffuse mass from end to end. Miles in diameter, it was nothing Leviathan could detect, nothing of which he could be aware.

"On through like an aspirin tablet," Carmichael said with awe. "Fellow dreamers, how are we going to communicate what we have seen on that screen? Who will believe in the space biome? We can't record it."

"Not yet," Allison said, "but we will. As I see it, Callisto and the Jovian complex have become secondary for us. We're the first space ecologists. Our job is and will be to analyze the life between worlds, the life between suns."

Tattersall nodded his rough head slowly.

"We've got the biggest ecosystem of all," he agreed. "We've got the Universe!"

PENNIES, OFF A DEAD MAN'S EYES

By Harlan Ellison

Harlan Ellison, winner of more HUGO Awards than any other writer, writes about people. In this final story two people are passing in the world, and a third has just passed out of it. It is a story of love and hate—and paying your dues. Read it—then think back on it and smile.

IT WAS a slow freight in from Kansas City. I'd nearly emptied all the fluid from my gut sac. There were no weeds or water to fill it again. When the freight hit the outermost switching lines of the yards it was already dark. I rolled myself off the edge of the boxcar, hit running, went twenty feet fast and slipped, fell to my hands and knees and tumbled over. When I got up there were tiny bits of white chalk stone imbedded in my palms. I rubbed them off but they really hurt.

I looked around, tried to gauge my position in relation to the town, and when I recognized the spire of the First Baptist, set off across the tracks in the right direction. A yard bull was running like crazy toward me, so I went dark and left him standing where I'd been, scratching the back of his head and looking around.

It took me forty minutes to walk to the center of town, through it and out the other side, in the direction of Littletown—the nigger section.

There was a coal-bin entrance to the All-Holiness Pentecostal Church of Christ the Master, and I slipped inside, smiling. In twelve years they hadn't repaired the

latch and lock. The stairs were dim in the basement darkness but I knew my way the way a child remembers his bedroom when the light is out. Across twelve years, I remembered.

There were the occasional dim rumblings of voices from upstairs, from the vestry, from the casket room, from the foyer.

Jedediah Parkman was laid out up there. Eighty-two years old, dead, tired, at the end of an endless road down which he had stumbled, black, poor, proud, helpless. No not helpless.

I climbed the stairs from the basement, laid my white hand against the dry, cracked wood of the door and thought of all the weight of black pressing back on the other side. Jed would have chuckled.

Through a crack in the jamb I saw nothing but wall opposite; I carefully opened the door. The hall was empty. They'd be moving into the vestry now. The service would be beginning. The preacher would be getting ready to tell the congregation about old Jed, what a good man he'd been, how he always had enough heart for the stray cats and deadbeat kids he picked up. How so many people owed him so much. Jed would have snorted.

But I'd arrived in time. How many other stray cats had made it?

I closed the basement door behind me, slid along the wall to the pantry door that opened into the small room adjacent to the vestry. In a moment I was inside. I turned off the light in the pantry—in case I had to go dark—then crept to the door in the opposite wall. I opened it a sliver and peered out into the vestry.

Since the bombing the chapel had been unusable. I'd heard about it even in Chicago. Seven had been killed, and Deacon Wilkie had been blinded by flying glass. They'd made do the best they could with the vestry.

Folding chairs were set up in rows. They were filled with the population of Littletown. They were two deep

around the walls. One or two white faces. I recognized a couple of other stray cats. It'd been twelve years; they looked as though they were making it. But they hadn't forgotten.

I WATCHED and counted blacks. One hundred and eighteen. A few days ago—I'd been in Kansas City—there'd been one hundred and nineteen. Now the one hundred and nineteenth black man in Danville's Littletown lay in his casket, atop sawhorses, in the front of the room, surrounded by flowers.

Hello, old Jed . . .

Twelve, it's been . . .

God, you're quiet. No chuckles, no laughs, Jed. You're dead. I know . . .

He lay, hands folded across his chest. Big catcher's-mitt paws folded, calluses hidden—sweet Jesus, I could see flickering candlelight glinting off his nails. They'd manicured his hands. Old Jed would have screamed, doing a thing like that to a man bit his nails to the quick.

Laying up in a shallow box, neat black patent-leather shoes pointing toward the ceiling; kinky salt-and-pepper hair flattened against the silk lining of the box (eighty-two, and that old man's hair still had black in it!); lay in his best suit, a black suit, clean white long-sleeve shirt and a yellow tie. On display. Looking down at himself, for sure, from the heaven he'd always believed was up there. Looking down at himself so fine and smiling—puffing proud, yes sir!

On each of his eyes a silver dollar.

To pay his way with the Man, across the River Jordan.

I didn't go in. Never intended to. Too many questions. Some of them might have remembered—I know the other stray cats would have. So I just laid back and waited to talk to old Jed private.

The service was a brief one. They cried a decent

amount. Then it was over and they filed past slowly. A couple of women did the big falling down trying to get in the box thing with him. Christ knows what Jed would've done with that. I waited till the room emptied out. Preacher and a couple of the brothers cleaned up, decided to leave the chairs till morning, shut off the lights and went. There was silence and a lot of shadows, just the candles still doing their slow motion. I waited a long time to make sure. Finally I opened the door a bit more and started to step through.

A sound came from the door to the outside, and I pulled back fast. I watched as the door opened and a tall, slim woman in black passed the chairs, walking toward the open casket. Veil over her face.

My gut sac went total empty right then. Lining started to burn. I thought sure she'd hear the rumbling. Sprayed it with stomach juice and that would hold it for a while till I could get weed and water. Burned.

I couldn't make out her face behind the veil. She walked up to the casket and stared down at Jed Parkman. Then she reached out a gloved hand toward the body, pulled it back, tried again and then held the hand motionless in the air above the cold meat. Slowly she swept the veil back over the wide-brimmed hat.

I drew in a breath. She was a white woman. More than just ordinarily beautiful. Stunning. One of those creatures God made just to be looked at. I held my breath—breathing would scare her away.

She kept looking at the corpse, then slowly she reached out again. Carefully, very carefully, she removed the coins from Jed's dead eyes. She dropped them into her purse. Then she lowered the veil and started to turn away. She stopped, turned back, kissed her fingertips and touched the cold lips of the penniless dead one.

She turned around and left the vestry. Very quickly.

I stood unmoving, watching nothing, chill and lost.

When you take the money off a dead man's eyes, it means he can't pay his passage to Heaven.

That white woman sent Jedediah Parkman straight to hell.

I went after her.

IF I hadn't keeled over I'd have caught her before she got on the train.

She wasn't far ahead of me but my gut was burning so bad—I knew if I didn't get some grass or weeds into it I'd be in wicked shape. That happened once in Seattle. I barely got out of the emergency ward before they could X-ray me. Broke into the hospital kitchen, pumped about eight pounds of Caesar salad and half a bottle of Sparkletts water into my sac and wound up bareass cold in a hospital gown, out on a Seattle street in the dead of winter.

Hadn't thought that for a second before I went over on my face, half a block from the Danville train station. Legs went idiot on me and over I fell. Had just enough sense to go dark before I hit. Lay there, a car might run over me. No idea how long I was out—but not long. Came back and crawled on my belly like a reptile onto a patch of grass. Chewed, pulling myself on my elbows. Got enough in to get me up, staggered the half block to the station, fell onto the water fountain stuck on the wall. Drank till the stationmaster leaned way over the ticket window, staring. Couldn't go dark, he'd seen me.

"You got business here, mister?"

I felt the lava juices subsiding. I could walk. Went up to him, said, "My fiancé, you know, a bad fight, she come down this way—" I let it wait. He watched me, wasn't giving away a little thing free.

"Look, we're supposed to be married next Thursday —I'm sorry I yelled at her. Half out of my—well, hell, mister, have you seen her? Tall girl, all in black, wearing a veil?" Sounded like a description of Mata Hari.

Old man scratched at the beard he'd sprouted since he'd come on at noon. "She bought a ticket for K. C. Train's 'bout to pull out."

Then I realized I'd been hearing the whoofing sounds of the train all this time. When my sac goes, everything goes. I started hearing and smelling and feeling the grain of the ticket counter under my hands. And I bolted out the door. Train was just getting ready to slide—express freight was almost loaded. Behind me the stationmaster was bellowing. "Ticket! Hey, mister—ticket!"

"Get it by the conductor."

I vaulted up onto the coach platform. The train edged out.

I pushed open the door to the coach and looked down the rows of seats. She was there, looking through the window into the darkness. I started toward her but thought better of it. A couple of dozen passengers were between her and me. I couldn't do anything here now anyway. I dropped into a scungy seat and puffs of dust went into the air.

I slid down and took off my right shoe. The twenty was folded neatly against the instep. It was all I'd put aside. But I knew the conductor would be along to punch my ticket. And I didn't want to get caught like Jed Parkman. I wanted my fare to be paid.

We'd see about it in Kansas City.

It was a change. Riding inside.

SHE WENT to a phone booth and dialed a place without looking up the number. I waited. She went out to stand in front of the terminal. After a while a car with two women came up and she got in. I went dark, opened the back door and slid in. They looked around and didn't see anything in the shadows back there.

The heavy-set woman driving asked, "Now what the hell was that?"

The pimply one with the plastic hair, seated in the middle, reached over the seat back and thumbed down the lock.

"Wind," she said.

"What wind?" the truck said.

But she pulled out.

I always liked K.C. Nice ride. Even in winter. But I didn't like the women. Not one of them.

They drove almost to the Missouri border, toward Weston. I knew a bourbon distillery out there. Best ever made. The truck pulled in at a big house set apart from slummy-looking places on a street with only one corner light. Whorehouse. Had to be. It was.

I didn't understand but I'd by God certainly find out soon. I'd arrived. But Jed was still traveling.

THE TRUCK said, "You pay the girl."

I picked out the tall, slim one in the harem pants and halter top. She couldn't be smart, I thought. With a face like that, to wind down in a crib was some kind of special stupid. Or something else.

We went upstairs. The room was like any bedroom. There were stuffed animals on the bed, a giraffe with pink day-glo spots, a koala, a floppy gopher or muskrat—I can't tell them apart. She had a photo of a movie star stuck in the frame of the bureau mirror. She took off the harem pants.

I said, "We'll talk."

She gave me a look I knew. Another freako.

"That's two bucks extra," she said.

I shook my head.

"Five should cover everything."

She shrugged and sat down on the edge of the bed, her thin legs straight out in front of her.

We stared at each other.

"Why'd you send Jed to Hell?"

Her head snapped up on her neck and she quivered like a hound on scent. She didn't even know how to ask me.

"You get the hell out of here!"

"I've got five bucks worth of something coming."

She bounced up off that bed and went straight across

the room. She was screaming before the door was open.

"Bren! Bren! C'mon, Bren! Help up here!"

I heard the foundations of the house shake and the rumble of artillery on the next hill. Then something big and hairy came at me. He had to come through the door sidewise. I put up my hands and that was all. He carried me straight across the room, into the bureau. My back snapped against the edge of the bureau and he bent me till everything started to slip up toward the ceiling. The girl ran out, still shouting. When she was gone I ended it for him.

There was a trellis outside the window. I went down until the ivy ripped loose and I fell the rest of the way.

That night I slept on the front porch of the house next door, in the glider, watching the ambulance and then the police cars come and go. Two unmarked police cars stayed very late. I don't think they were on duty.

I WAITED two days, sleeping on the front porch of the house next door. I'd have gone dark more than I did but there were three empty lots between me and the whorehouse and the people with the front porch had gone away for a while. I supposed on a winter vacation, maybe. There was plenty of weed and grass around and I let snow melt in an empty milk bottle. At night I'd go dark and steal Hydrox Cookies and milk and beef jerky from a twenty-four-hour market. I don't eat much, usually. Missed coffee, though.

On the second day I jimmied a window in the empty house. Just to be ready.

She came out toward evening of the second day.

I went dark, waited on the sidewalk for her and she walked straight into my fist.

In the empty house, I laid her out on a canopied bed in the master bedroom. I was slouched in a chair across from the bed when she came to and sat up. She shook her head, looked around, focused, saw me and started to let go with the screaming again.

I sat forward in the chair and said very softly, "What happened to Bren—I can do that again."

She looked sick and shut her mouth.

"Now we go back to where we were," I said, getting up.

I walked over and stood near her. She lay back, terrified, no other word for it.

"How did you know Jed?" My voice was level but I was hurting.

"I'm his daughter."

"I can make you tell the truth."

"I'm not lying, I'm his—I was his daughter."

"You're white."

She didn't say anything.

"Okay, why did you send him to hell? You know what it means to take the money."

She snorted a very shitty laugh.

"Lady, you better understand something. I don't know who the hell you are. But that old man found me when I was seven years old and kept me alive till I was old enough to go it on my own. Now he meant stuff to me, lady, so I can see myself getting mad enough at you to do just about anything. More green than even Bren. So you feel like telling me why you'd do something like that to a man who was kind to everybody?"

Her face went hard. Even scared, she hated.

"And just what the hell do you know? Yeah, he had kind for everybody. Everybody 'cept his own." Then, softly, "Everybody 'cept me."

I couldn't tell if she was sick or deluded or just putting me on. Lying? Not where she was. No reason for it. And she'd seen that Bren. No, she was telling the truth—as she believed it to be.

A white girl with old Jed for a father?

It didn't make any sense.

Unless . . .

There are some you can meet—the strange, twisted ones—and you know them by an aura, a scent, a *feel*

about them, that if you had one *single word*—like "junkie" or "nympho" or "hooker" or "Bircher"—a key word that labeled their secret thing, you would understand all the inexplicable, off-center things about them. The one-word people. One word and you've got the handle on them. One word like "wino" or "diabetic" or "puritan" or—

"Passing?"

She didn't answer. She just stared at me and hated me. And I looked into her face to see it, now that I knew what it was—but it wasn't there, of course. She was good at it. And that explained what had been between her and old Jedediah Parkman. Why she'd kissed the dead meat and sent it straight to hell. But not the kind of hell Jed had consigned her to. If he'd had all that kind of love for stray cats like me I could imagine how strong his hate and frustration and shame would have been at one of his own pretending to be what she wasn't.

"You never know about people," I said to her. "He took in all kinds and didn't care where they came from or what they were. Just as long as they didn't lie about it. He had a lot of love, that guy."

She was waiting for me to do something bad to her, what she thought she had coming. I laughed, but not the way Jed used to laugh. Not that way.

"Lady, I ain't your daddy. He's punished you all he's ever going to. And you and me, neither one of us is white and we're too much alike for me to punish you."

Passing in the world. How about that. She didn't know what the color line even looked like. Black for white—hell, that's a cinch. Jed, Jed, you poor old nigger bastard. You knew I couldn't get home again and you taught me how to pass *into* this world so they wouldn't kill me. But you couldn't handle it when it happened to you.

I pulled my last five bucks out of my pocket and tossed it on the end of the bed.

"Here, baby, get it changed and keep a couple of silver dollars for your own party. Maybe Jed'll be waiting and you can straighten it out between you."

Then I went dark and started to leave. She was staring at where, I'd been, her mouth open, as I paused in the doorway.

"And keep the change," I said.

After all, she'd paid the dues for me, hadn't she?

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