

Vertex

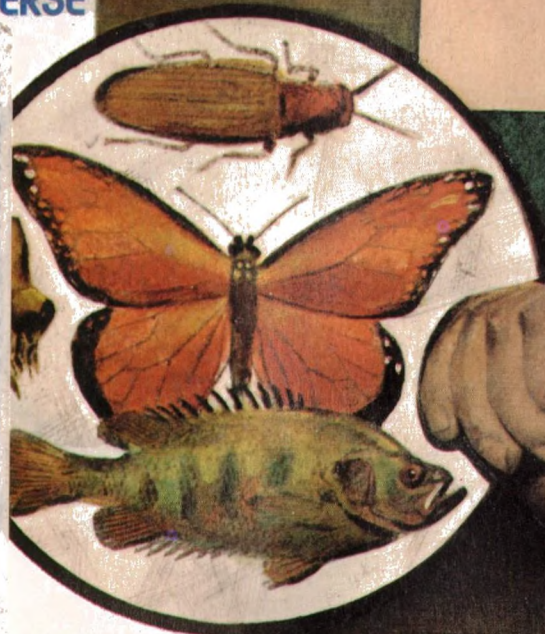
THE MAGAZINE OF SCIENCE FICTION

**IN THE HOUSE OF
DOUBLE MINDS**
by Robert Silverberg

Vertex Previews
THE TERMINAL MAN

John Brunner's
BLOODSTREAM

NEUTRINOS:
inhabitants
of the
**GHOST
UNIVERSE**



* * * * *

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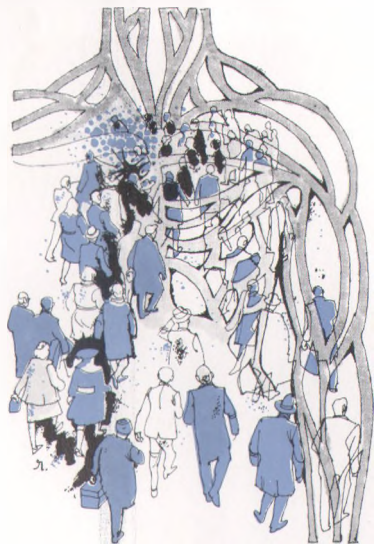
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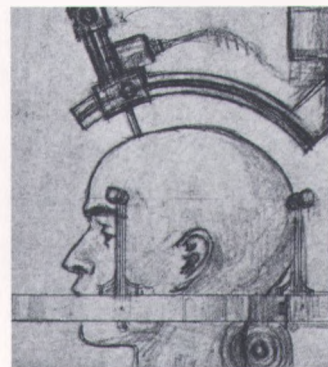
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First, before getting up on my soapbox, let me get a couple of apologies and/or corrections out of the way. Apology number one to Joanna Russ. In the February issue we ran her article, *The Image of Women in SF*, without giving credit to The Red Clay Reader, in which the article, in slightly different form, appeared in November 1970. Not only was this unfair to both the Reader and Ms. Russ, but not mentioning *when* the article was first written makes the question of why Ms. Russ failed to mention some recent work on gender and sex roles inevitable. Apology number two is to Jeff Dowden, who took the excellent photos of Philip K. Dick used in our interview with that gentleman, also in the February issue. And finally, giving credit where credit is due, the photo of James Doohan used in October issue was taken by M. Stanford Burns.

Now onto the soap box. Or, in this case, thank you box. For I want to say a thank you to a large group of fans and writers who have shown, again, that there's still some humanity left in the science fiction community.

There's a little book store, devoted to SF and fantasy *only*, in the California college town of Westwood (home of UCLA). While this SF establishment, known to one and all as *A Change of Hobbitt*, is small, its fame is widespread, and people from all over the country use the knowledge and abilities of the cheery, busy young brunette named Sherry Gottlieb, owner of the place, to find whatever it is they are looking for in SF and/or fantasy.

Recently it was decided that more room was needed for the solidly packed shelves, and for the customers who habitually drop in to browse, rap, sell rare old books, or to simply lie about on Sherry's cushions and discuss the world. (Bill Rotsler says they may also come around to ogle the tiny flower tattoo in Sherry's cleavage, but he isn't sure. He says he's above such things. Mainly because he's a foot taller than Sherry.) Here's Rotsler's version of what happened next:

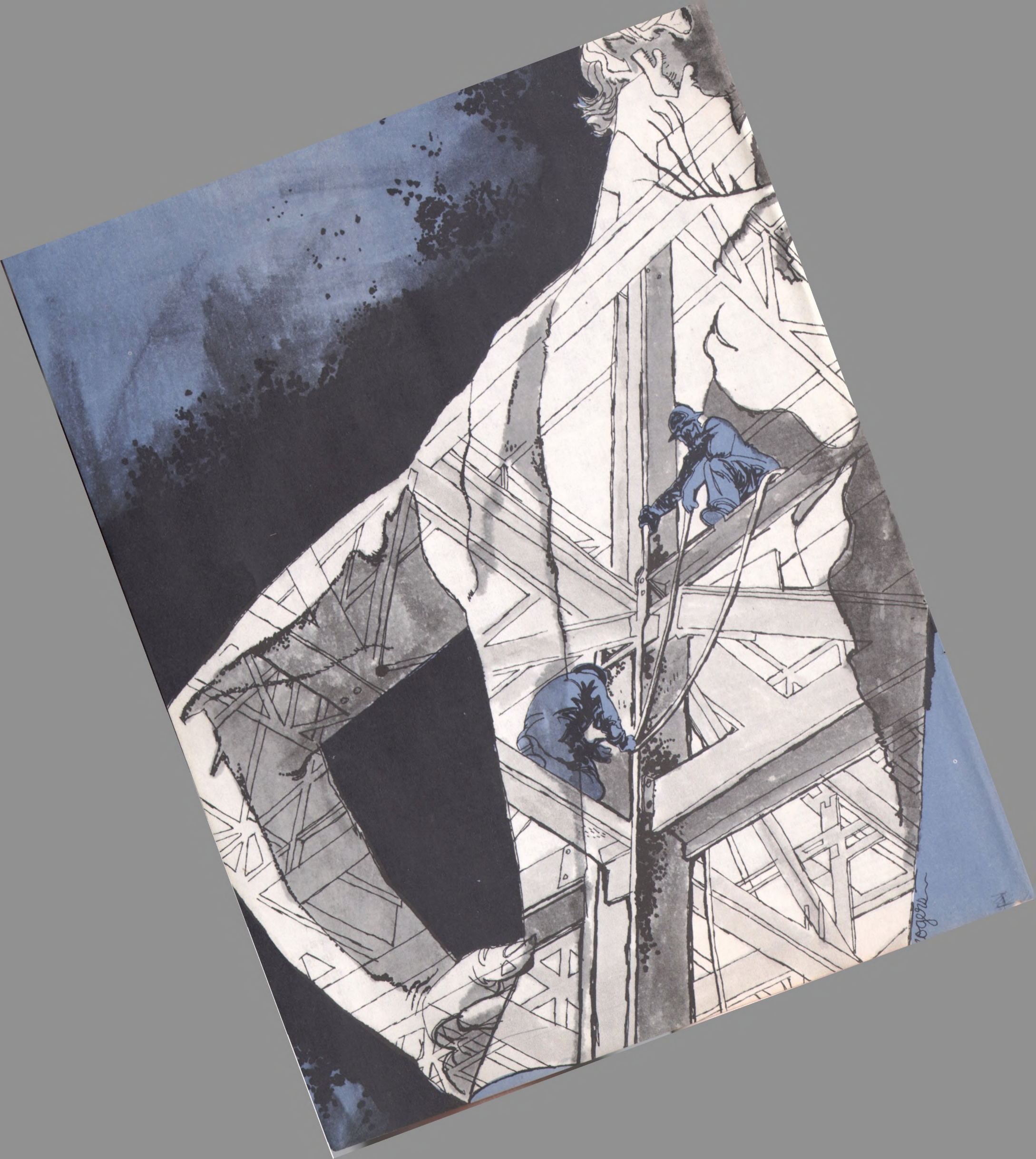
"The trouble was that the whole operation was run on a limited budget, and much money was needed to move from her 2nd floor location at the back of a laundromat to a street-level store. That is where her friends; science fiction fans and many professional authors, stepped in to help.

"A day-long auction and quasi-party was scheduled for Strange Hall in KPFK, a local FM station. Ray Bradbury read some of his poetry, and Theodore Sturgeon, David Gerrold, Larry Niven, Ed Bryant, Jerry Pournelle and Harlan Ellison read from works in progress or finished stories. Harlan was also the auctioneer, selling off manuscripts and other items donated by the local authors and by Philip K. Dick and Robert Silverberg, who could not attend. There was food and drink and a chance for a lot of people to meet their favorite authors, to gather autographs and to enjoy the fun.

"Ellison dominated the day in typical Harlan style, insulting and forceful, anti-dummy and anti-anti. I drew and donated a number of cartoons and volunteered to do a cartoon for anyone which would be for or against anyone they wanted. A pretty young girl purchased my services and selected a "for" Harlan format. The silly misguided wench."

Those Rotsler cartoons, the donated items, and the money paid by the guests at the auction raised some \$2500 for the *Hobbitt*, which we are sure will insure many more years of the *Hobbitt* being a landmark in our field. All thanks to a great group of fans and writers for keeping science fiction the same personal and essentially friendly field it has been in the past.

Don Pfeil, Editor





**Neanderthal man gave way
to modern man. Is it
now time for modern man
to give way to . . . ?**

BLOODSTREAM

**fiction / John Brunner
artist / Monte Rogers**

The doorbell rang at a quarter to two. I wasn't asleep. I was still trying to make it clear to my wife Dinah how going to call on an old friend at nine o'clock had resulted in my staying out until the small hours.

I ignored it. It rang again, and Dinah ordered me to answer before the noise woke the children. Too late. The howling started within seconds—and that of course was my fault too, for not going instantly to the door. Furious, I stormed downstairs, determined to tell the caller to go to hell.

But outside on the wet street was parked a police-car with the engine running, uttering the blurred incomprehensibilities of short-wave radio messages. Suddenly I was shivering, not because I'd come out in a cold night in my dressing-gown.

Face in shadow under a shabby hat, a man said, "Sorry to bother you at this time of night, sir, but are you Mr. Christopher Hill?"

I nodded, blinking against the bitter wind that whipped my face with sharp rain.

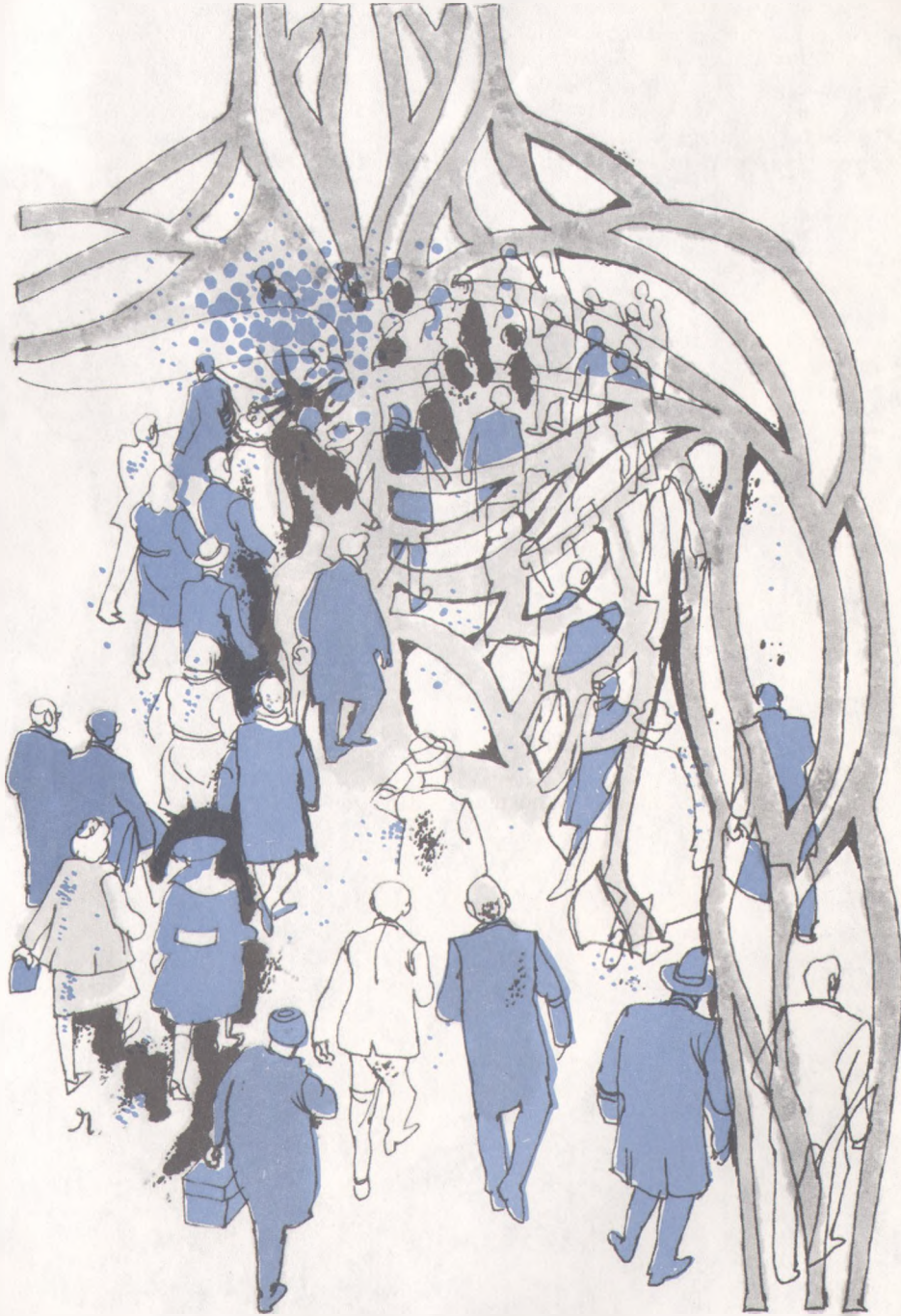
"Do you know a Dr. William Brush?"

"Yes!" My heart sank. "What's he done?"

"It's not so much what he's done, sir, as what's been done to him. I'm afraid he's been found dead. And since I understand you were with him earlier tonight . . . May I come in?"

Of all the people I'd met while I was up at Oxford, I liked Bill Brush the most, even though we were studying different subjects—mine was political economy and he was reading biology and mathematics. But don't imagine he was one of your ivory-tower scientists. He was an outstanding figure in the university, involved with every kind of social activity from debating to chess, and sought after by uncountable would-be acquaintances. I regarded myself as lucky to be one of the handful of friends he treated as intimates, and always enjoyed his company, whether we were playing tennis together or having a bull-session into the dawn about a social problem which interested us both.

We were separated by our two years' National Service, because he went into the Navy and I had to settle for the Army, and when I wrote to him following my discharge none of my letters was answered, he'd moved, and when I tried to trace him through his father I discovered the old man had died and the house he lived in had been sold. Eventually I gave up, but I was convinced sooner



“A living thing is capable of drawing into its structure raw materials from its environment—some crude, some previously processed by other organisms . . .”

or later I'd notice his name in the papers. Someone with his talents was bound to make a mark in the world, perhaps even to the point of winning a Nobel prize for science . . . but if it had turned out to be for literature or peace I wouldn't have been surprised. Bill had left a very deep impression on me.

Which was why, when I ran into him again after a lapse of ten years—and it was a miracle I didn't do so literally—the meeting came as a shock.

I'd got myself a job with an organization run by the Greater London Council moving industry out of the city to the satellite New Towns, not work I found especially pleasant because it involved so much driving around congested and rundown industrial areas and so much argument with stick-in-the-mud but wealthy businessmen. Still, the task was one which badly needed doing, so I'd swallowed my frustration for five years. I had a wife and family to consider, after all.

On this particular morning I was heading out of the West End towards Edgware, to see a manufacturer we wanted to site his new factory in an under-employed area. I'd just passed the big telephone exchange on Shoot-up Hill when a man lost in thought wandered straight into the path of my car.

I slammed my brakes on, rolled down my window to tell him in basic English what I thought of his jaywalking . . . and the words died in my throat.

It was Bill Brush. But as I had never expected to see him in this life or any other.

He wasn't *dirty*, exactly. He looked more—well, neglected. His hair was all over the place, he couldn't have shaved more recently than three days ago, and as for his clothes . . . ! Ten years previously he'd been an "Isis Idol", profiled as an outstanding student in the Oxford University magazine, and they'd called him a trend-setter in male fashion. Now he was wearing, in order from top to bottom, a black sweater with a hole in one elbow, a pair of off-grey trousers with a large ink-blot on the front, and boots which couldn't have been shined since he bought them. In his hand he clutched a file of papers, and that was the only new looking thing about him.

I said, as soon as I was able, "Bill! God's name, what have you been doing to yourself?"

He didn't recognize me at first, though I certainly hadn't changed as much as he had, but stood gazing at me with such lack of concentration that he was nearly knocked down all over again when an-

other car swung out to pass mine. I shouted at him to get out of the roadway, pulled in at the curb, and hurried back to join him.

By then he'd remembered who I was, and shook my hand with no noticeable enthusiasm. He answered my questions with shrugs and monosyllables; his eyes wandered, never settling on my face. I was convinced within a few minutes that he must have suffered a nervous breakdown. Moreover he looked so gaunt I guessed he'd gone for weeks without a square meal.

Running across an old friend like that called for celebrations, drinks together, a long talk. I was furious that the urgency of my appointment prevented me from finding out what had happened to him here and now, but I insisted on him giving me his address. He named a street in the NW 6 postal zone which I recognised because it was due for slum-clearance and we'd been sent a list of people housed there who were willing to be moved to a New Town. The idea of his living in such surroundings horrified me still more. I asked for his phone number, and he shook his head, uttering his first statement of any length so far.

"I haven't got a phone. It's far too dangerous."

Dangerous? My head filled with visions of paranoia—I once had an elderly aunt who swore that phone-wires conveyed psychic attacks from her enemies. But in these circumstances I had no time to ask for explanations. I brought out one of my business cards and pressed it into his hand. He glanced at it, at first with no hint of interest—and then, all of a sudden, he tensed.

"Oh!" he exclaimed. "You're with those people, are you? Then I suppose it's about time somebody told you what you're really doing. Why don't you drop by at my place tonight?"

I was about to say I'd be delighted, which wasn't wholly true, but I felt I owed something to my former good friend, when he added, "But make sure you pick a proper time. We've absolutely got to spread ourselves around the clock. Suppose I expect you at twenty-five to one?"

For an instant I was speechless. That appeared to settle it: Bill *must* have had a breakdown. I hunted for tactful excuses that wouldn't offend him.

"Ah . . . Well, I'm afraid that might be a bit late. You see, our second kid Roland only just finished teething, and Dinah and I haven't caught up on our lost sleep."

And I waited apprehensively to see

what effect the words would have. This man was so changed from the Bill Brush I'd known at Oxford I honestly thought he might become violent if he was crossed.

But he seemed to grow resigned. "Oh well . . . At least make it after nine and before ten, then, not before seven or after eleven when the roads are crowded."

I assured him heartily that that would suit me fine. It would indeed be easier to persuade Dinah to put up with my visiting him on my own if I'd gone home to dinner first. But that, I felt sure, had nothing to do with Bill's choice of the time. Avoiding the rush-hours was one thing, and sensible enough; "spreading ourselves around the clock" sounded like something else entirely.

I was wishing sincerely that I'd turned his invitation down by the time I found my way to his address that night. Part of my depression was due to worrying all afternoon long about the effect ten years had had on him; I could never have imagined him sinking so low. Part was due to Dinah; I'd talked so often over the years about my marvellous old friend Bill Brush that on learning I was going to see him without taking her she'd let go with one of her usual diatribes about how she was stuck in the house all day with two squalling kids and never had a chance to go out and have fun any more . . . You know the kind of thing. In that state my reasonable explanations feel on deaf ears, as always. In the end I'd just taken my coat and walked out.

But most of all I was brought down by the district I'd arrived in. The street where Bill lived was just as bad as the tables of cold figures passing across my desk had suggested: row after row of crumbling old houses, overcrowded—mostly split into single rooms for letting—and not just badly maintained but falling down. Knowing that the area was scheduled for clearance, the landlords were fighting tooth and nail to avoid spending money on repairs. I saw broken windows, cracked porches, holes in roofs where tiles had slipped away. And Bill's home was a fair match for its neighbours, apart from one thing: whereas all the nearby doors were decorated with up to a dozen bell-pushes, indicating the number of families crammed inside, his did not even have one bell—just a rusty knocker.

I hammered on it, and waited. No reply. I checked my watch to make sure

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REPLY TO A LADY

comment/Poul Anderson

In the February 1974 *Vertex* we ran an article titled "The Image Of Women in Science Fiction" by Ms. Joanna Russ. Here, in a rebuttal to that article, is Mr. Poul Anderson, one of science fiction's top authors.

In recent years Joanna Russ has emerged as one of the perhaps half a dozen science fiction critics worth anybody's attention. This is meant as a considerable compliment, since like many writers I doubt if there are twice that many critics in all literature of whom it can honestly be said. When in the following I express disagreement with certain remarks of hers, the reason is that they are intelligently made remarks which deserve an answer. And if the argument seems illustrated by an undue proportion of stories with my by-line, the reason is merely that for them the facts lie handy, not that they have any special importance. What we will discuss is not literary merit or demerit, but a set of attitudes which she attributes to our field.

In the February 1974 *Magazine of Fantasy and Science Fiction* (where, by the way, she has an excellent tale of her own) she says in the book review column: "... too many typical science fiction horror stories are not the universal dystopias they pretend to be, but rather the unhappy wails of privilege-coming-to-an-end. Take, for example, the usual Overpopulation Story, in which Americans have to live without



private ranch houses, or the typical Pollution Story, in which far too often the real gripe is that 'we' must subsist on soybeans and vegetable starch (as if the vast majority of the human race since the Bronze Age hadn't been doing just that) or the Violence Story which deplores the fact (as somebody recently pointed out) that violence is becoming democratized."

There is a measure of truth here, but also a great deal to mislead. That is, we can find plenty of shallow writing which fits Ms. Russ' description. But any area of art must be judged by its best, not its worst specimens—e.g., the love story of *Romeo and Juliet* rather than, hm, *Love Story*—and some science fiction on these themes has confronted truths such as these:

The horror shown is not that Americans live without private ranch homes, but without privacy; and so does everyone else in the world. If "we" have a meager diet, nobody else is any better off, and nobody has any hope of improvement. (After all, without rich countries to give them a leg up, the poor countries can only grow poorer.) If violence is democratized, this means that it is no longer under such restraints as

the law has imposed on policemen; I have yet to hear of a mugger or rapist observing due process.

Without having inquired into Ms. Russ' politics, no business of mine, I get the impression she feels something is fundamentally wrong with Western bourgeois culture and sweeping changes are necessary. Now Lord knows that culture isn't suited for every people on Earth, and even from its own viewpoint has gross imperfections. But never forget, those who have most energetically pushed through the most radical alterations have been the Fascists, Nazis, and Communists. Reforms not quite that thoroughgoing, made in the democratic fashion which Ms. Russ surely advocates, have brought Sweden to stagnation and England to a quagmire. Most of the many faults of American "capitalism" stem from the fact that it isn't capitalism at all, at least of the free enterprise variety, and has not been for a long time. Nations with advanced technology can indeed produce structures "inadequate to the complexities of a Seventh Century European mud hut."

But I don't wish to argue that subject here, merely suggest that Ms. Russ has let her political convictions influence her literary judgment to the detriment of the latter. It has caused her reviews of work by writers such as Gordon Dickson and myself to deal at length with social and individual relationships depicted which she finds objectionable—as if the authors might not also—instead of concentrating her talent on the quality of the books themselves.

For instance, she expressed herself vehemently as being repelled by the female characters in my *Satan's World*. In this she was not alone. On the whole, I quite agree too. But that was the way that story went. Its setting was a civilization in breakdown. The large majority of my stuff reflects a lifelong gynophilia. And this brings us to the main point at issue, her accusation that science fiction in general is antifeminist. She makes it in an essay in *Vertex*, February 1974. I hereby deny the charge.

True, most science fiction has been male-oriented, and much has contained "he-men." Again we cannot judge by hackwork; we must examine the best. And there, in what is probably the bulk of cases, women have not been relevant.

No insult whatsoever is meant. I simply point out that the stories have not been concerned with the relationship of

turn to page 99

I HAVE NO MOUTH AND I MUST SCREAM



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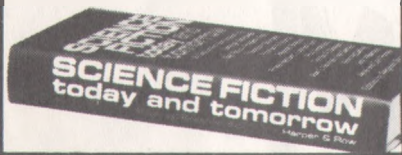
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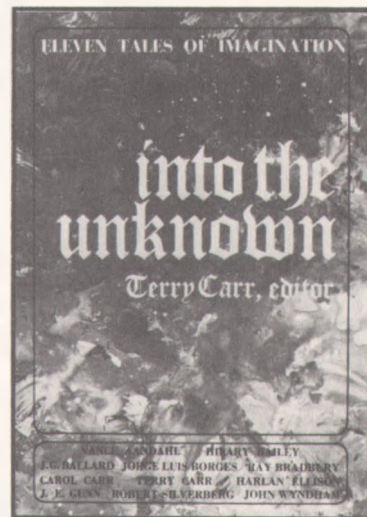
Alan Dean Foster
Ballantine Books, \$1.25

fun book, and one well worth reading for anyone who remembers when science fiction was fun.

There is only one real problem with this book, and, quite frankly, it's a problem which might well hurt future sales of books by Mr. Foster. The problem is that of staying awake through the first twenty pages or so of this book. They are often boring, disconnected, and both the writing and the characterization is quite old-fashioned, as if this was a reprint of a book which was written in the 40's or 50's. Because of this many readers will probably stick the book away on the shelf without reading on, would avoid buying this author's next book, and would be making a very big mistake.

Once the book gets moving, it becomes a science fiction *adventure* story ranking with (and reminding one of) the best of Hal Clement and the adventure stories of Philip Jose Farmer. Granted, it *is* old-fashioned in the sense that you will spend more time enjoying the action than pondering deep philosophical truths, and if you happen to believe in required relevance, you won't find it here. But you will find a story that (after those first twenty pages) holds interest, makes it hard to stop when you reach the end of a chapter, describes a world that is both totally alien and totally real, and presents some of the most easily visualized and least typical "little-green-men" type aliens we've read about since *Mission of Gravity* or the heyday of L. Sprague deCamp.

There are a lot of side-plots that the author seems to lose track of, and occasionally he pulls off the sneaky stunt of making the plot look like "that same old thing," like when he obviously begins to copy "The Magnificent Seven" then takes you off down a completely different track, but all in all this is a



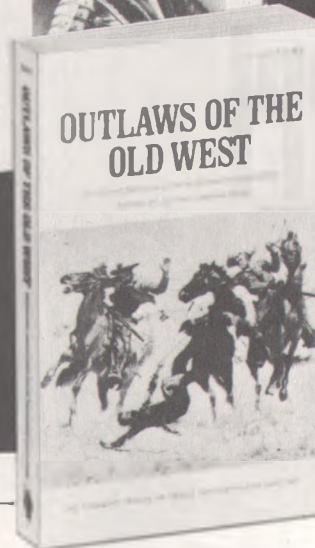
INTO THE UNKNOWN

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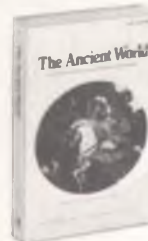
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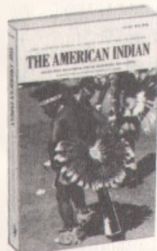
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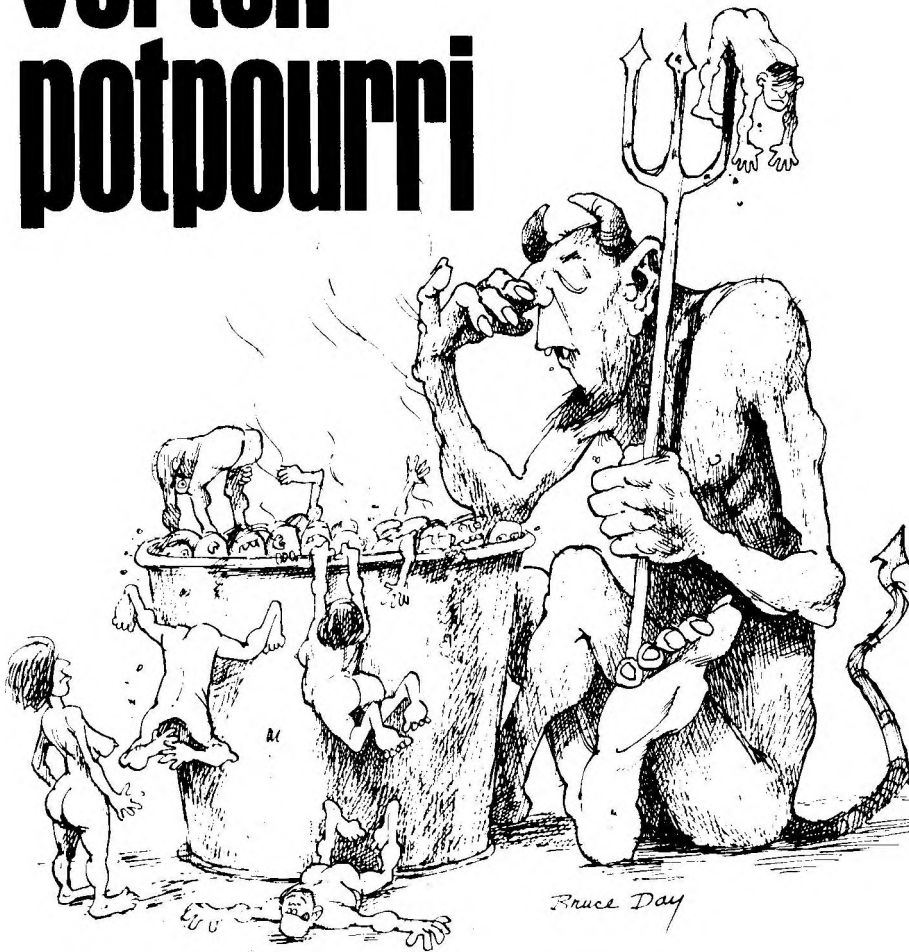
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vertex potpourri



THE CREATURE WHO YEARNED FOR FIRE

by Scott Edelstein

Joe Proctor had just lit up a Camel when half a dozen terrorized people ran past him, yowling. Joe leaned against a '67 Chevy and watched them scramble down the sidewalk. He took a few more puffs from his cigarette.

There was a painful shriek, and twenty more people, mostly men in business suits, fled down the middle of the road, falling over each other in their panic.

"Say," Joe said, after pausing to blow a few smoke rings. "Is anything wrong?"

"A monster!" someone screeched.

Joe took another puff of his Camel. A crowd came surging down the street, trampling themselves and trumpeting like elephants.

"Hey!" Joe shouted as the crowd neared him. "What's this I hear about a monster?"

A young woman whose eyes were wild with fear grabbed his sleeve. "It's coming!" she said hysterically. "The blob! Quick! We've got to get away!"

Joe brushed her arm off him. "Yeah, okay, soon as I finish this cigarette. I can't smoke and run at the same time."

"Hurry!" the woman shouted, and was swept away in the herd of bodies that thundered past and, miraculously, left Joe untouched.

Eventually, everyone had run past. The street was now foreboding in its emptiness and silence. Joe took another puff.

Then he saw it; a huge, slimy yellow blob, over ten feet in diameter, slithering along the sidewalk. It left small patches of bubbling yellow jelly every few yards. It squirmed its way directly toward Joe.

Joe took a deep drag on his Camel. The creature drew nearer.

The thing came to within three feet of Joe, then stopped. It extended a small white cylinder on the end of a pseudo-pod and said, "Hey, buddy, you got a light?" Its voice was heavily accented.

"Sure," Joe said, lighting the creature's cigarette with his burning butt. "You smoke Camels too, huh?"

"All the time," the blob said. A small lump appeared on top of the creature and extended itself toward the sky. "Nice day if it don't rain."

AND THEN HE DIED

by Edward Bryant

There was no pain; the machines ensured that. About his deathbed was the bland smoothness Outerbridge had always detested. His son's unctuous manner did not help.

"Goddammit, turn off the machine."

"Father, I can't do that," Jerry repeated. "It would be . . ." He trailed fingers through thinning hair in a nervous gesture. "Immoral."

"Hah." The old man smiled a death's head smile. "You won't take a direct order from the board chairman of Central Nuclear? I'm the single most powerful man between Chicago and the west coast."

"No."

"What?"

Louder, Jerry said, "No."

"I suppose not. I'm not very intimidating this way." Outerbridge paused. "Well, if you won't turn off the machine, how long?"

Jerry said, "There's a priest outside."

Outerbridge turned his head the few degrees allowed him to look out the window. The room was exclusive and isolate, on the top level of an expensive private hospital. The outer wall was all glass and it faced the west. "Goddamn mountains. You can't see them for the smog."

"The priest," said Jerry. "Can I bring him in?"

"No. Absolutely not." The old man's voice strengthened momentarily. "Maybe I can't get you to do the smart

thing and pull the plug on this machine; but I can order you not to let that depressing bead-stringer in here. Does that offend your morality?"

"If you saw the priest, it would make Rina happy."

"Rina, Rina. Christ, I never thought she'd outlive me."

"Women usually do."

Outerbridge turned back to the window. "Look at that. Puke-yellow and shit-brown. All the colors of my companies. How long's the inversion been down?"

"Thirty-two days," said Jerry. "Maybe thirty-one. We're still holding the injunctions."

"Keep fighting," said Outerbridge. "These clowns need power more than they want sky."

"It's worse on the coasts."

"They had more of a start."

"TV said people are dropping like flies."

"You're a great comfort," said Outerbridge. He laughed and it exited as a cough. "Did you know I was once an environmentalist?"

Jerry shook his head. He was wary of the old man, even at this point.

"Yes, I was. Sierra Club, Friends of the Earth, everything. Board would shit bricks if they knew."

"Oh, really?"

"Don't humor me. I was the worst ecology freak ever expelled from Stanford."

The old man began to cough again, and the son decided it was no longer laughter. He arose from the fiberglass chair and moved indecisively toward the door.

"Sit down, dammit. Not the priest."

"I was going for the doctor."

"I don't need him either. The machine does just fine."

"You're all right?"

"Shut up and sit down."

Jerry sat.

"There's something I wanted to know," said Outerbridge.

"What?"

"You don't have the answer. I thought nobody could figure it out but me, and I never did discover it."

"What."

The old man's eyes searched for the Rockies again. "How to save the world. I figured there were several alternatives. All I had to do was pick the right one. I had power; God, how I had power. Unlike you."

"Dad, I—"

"Be quiet. I wasn't impugning your character. I mean that you don't have

the same arena to operate in that I did. Back then there seemed to be a lot more options. Not like now with this endless caucus race just to stay even." He snorted. "Caucus race, hell. We're slipping behind every goddamn day. Every minute—You ever hear of Ben Tre?"

Jerry shook his head silently.

"Village out of the war I used to tell stories about when you were little. It got a lot of play in the press because we had to destroy it to save it."

Outerbridge paused; the silence lengthened. Jerry cleared his throat.

"I'm still alive," said the old man. "I was feeling sorry for myself. I think I've destroyed the world, trying to save it. Technology just wasn't enough—" He sighed. "That'd make one hell of an epitaph."

Jerry said automatically, "I thought you wanted—"

"I do, you idiot. Cremated and scattered over Pike's Peak. I was talking about an epitaph for the world. Listen, have you ever heard of Atman?"

"No, Dad."

"It's an imperceptive son who doesn't know his father's a closet mystic. I fear for Central Nuclear—hell, you won't have long to worry. Never mind—forget I said that. What I meant about Atman was that it's the big holdover from those early years. Atman, the divine all, the ultimate reality. We all were formed from it; we'll all go back." His dry voice became wistful. "To break down the walls of my ego and merge with the world . . . to go back . . ."

"Dad? Dad!"

The machine beeped loudly.

Outerbridge shook his head slowly, tired; and then he died.

The feeling of release came first, but only briefly. That which had been Outerbridge expanded intangibly, diffusing into the sky, the earth, the seas. Freedom, quick and open, metaphysical wine from an invisible throat.

Is this what it's like? Still expanding, merging. *Of course it is. Stupid question.*

And then the agony. Like the worst tooth ache/nerve exposed/broken bone grinding through organs/stomach cramp/pelvic cramps/burn sear/testicles smashed/child bulling his way through the cervix.

His lungs filled with corrosive gasses—he could recognize and catalogue, and, worst of all, feel every minute, discreet particle: nitrogen oxides, asbestos, carbon monoxide, unburned hydrocarbons, hydrogen sulfide, ozone.

His tongue was coated with lead, cad-

mium, mercury.

Spilled oil filmed over his skin, blocking the pores, stifling, stinking.

His limbs fried with radiation, blistering; beneath the skin and muscle and bone, the cells altered in tiny, horrible ways.

His body—his guts twisted with unbearable tectonic pressures as artificial lakes rolled across new beds. Deserts burned hotter. Waters eutrophized, reeking with nutrient broths that stifled life.

A billion cancers metastasized simultaneously. Cannibal cells fed off themselves and one another. The effluvia stacked to the sky, there to merge with garbage more tenuous, but not less deadly.

Outerbridge merged with the Earth and he/it/they screamed.

Oh God—but I am God—

Not this. Let me live.

Let me be born.

It would be better . . .

Anything.

Anyth—

AT THE END

by Alice Laurance

The winters on the *prison planet* were brutal, and worst of all was the West Wind. It roared across the plains, uprooting everything in its path, and howled around the Palace. When it blew, even the jailors didn't go outside. The prisoners never went out.

She sat in her cell and watched the progress of the wind through the transparent wall. Dead leaves swirled, a branch on a tree whipped back and forth until it broke free and was siezed by the wind and hurled out of sight. She could imagine being picked up by that wind and swept away, hurtling over the ground until she came to rest—where? She longed to be outside in the power of the wind, and that was strange because she'd never cared for violent weather. Now she ached for it.

When she first came, she had pounded on the transparent wall of her cell, seeking freedom, but she lacked the strength to break that barrier. Her race was fragile and she had grown even more delicate with the passing years. Even before being brought to the Palace, her strength had been slight, and now she could feel her slim reserves slipping still further away each day.

She sighed. It might have helped if

she could have known what crime she had been jailed for, or how long a sentence she must serve but, then, no one in the Palace knew that. Each must judge himself, she thought, and the sentence is indefinite.

She was well cared for here, she couldn't complain of being mistreated. There was pain, but it was the pain of age, not of punishment. It was painful to grow old, to outlive your friends, your mate, even your children, as she had. Perhaps that was her crime? She contemplated. Yes, it might be.

She reviewed again her life, which seemed blameless, dwelling on the pleasant days of youth busy with dreaming and courting; the quiet middle years, so patterned; even the later years filled with the music and poetry *he* had loved. It had all been lovely until she was left alone. Then it had not been lovely any more. It had been a time of terror—not of being alone but of having her privacy invaded. And finally the ultimate violation when she had been seized and brought to the Palace. The Palace on the prison planet from which there was no escape.

She looked through the wall again. It was a lovely view. When they brought her here, they'd told her she'd love the view. Why should they tell her that? Does the jailor care what the inmate feels? They'd given her no option, they brought her to the Palace and left her and she'd known she would never leave this place—so why should they tell her she'd love the view? Why should they care about her pleasure? Why should they want her to admire the view? It was all most perplexing.

It would be mealtime soon. The food was tasteless—or was all food tasteless now? She seemed to remember thinking that in the last days alone. It was hard to remember when she'd first noticed that things weren't the same: food lacked seasoning, perfume lack scent, sounds were softer and the world had taken on the blurred edges and muted colors so familiar now. Never mind, soon it would be mealtime and she had to eat. It was necessary to keep up her strength, for strength was needed to escape.

Escape! Would she ever succeed?

But how could she? She had no plan, no glimmering of a scheme. She must think! She could not break the transparent wall of her cell, but the door was never locked. It had been a long time since she'd left her cell and wandered through the Palace. It was allowed, but she didn't like to. She kept encountering the other prisoners—wrinkled, toothless,

stooped men and women who urged her to join them in games or remembering—no, she didn't like meeting them. When she'd first come here, she had wandered the corridors frequently, but she'd never found the way out, and her trips invariably ended with a jailor tapping her on the arm, smiling and leading her back to her cell. They urged her to make friends with the other inmates, but she was too old to make new friends; the memory of friendship was enough. She didn't need companionship, she needed privacy. To be alone. To be alone and to know she could be alone as long as she wished; to know no one would come through a door uninvited and demand her attention.

The door opened and a figure appeared, carrying a tray. There were some words but she didn't listen to them; it didn't matter what was said. Something about mealtime. She stood up painfully and crossed her cell to the table where the tray waited. She sat down and looked at the food. It was nutritious, she was certain. It would fulfill all her body's needs. Why couldn't they let her fulfill her other needs?

She looked at the food and suddenly wondered what would happen if she refused to eat it? Or, no, not refused, but if she didn't eat it, only they thought she had! She smiled. Her little rebellion delighted her and she looked around furtively before emptying the plate into the waste basket and covering the evidence with some tissues. There! That would show them. She didn't notice the remains of a previous meal similarly concealed and she would not have remembered her previous rebellions even if she had. She could remember her youth with ease (the lilac ballgown, *his* look as he proposed, a picnic in the park near the bandstand), but it was so difficult to recall yesterday.

"Delicious," she said pleasantly, when the attendant came for the tray.

But her strength! She had to keep her strength up!

But what for? To escape? She would never escape. And escape to what? To a world she didn't know? For this was the prison planet, not the world she remembered from the other time, the time before she'd been brought to the Palace. She had been foolish to dream of escape.

She smiled sadly and lay down to sleep. She felt so tired. She didn't remember all the meals hidden in the waste basket, she just knew her strength was gone. She watched the West Wind through the transparent wall, and she

was aware of the attendants who came in, only when they came between her and the view of the Wind. She cried then, until they moved and let her see the trees bending and bowing to the wind's power.

She longed for the wind, to feel its strength against her frail body, to feel herself caught in its awesome power. And then, not knowing that days had passed since she lay down to sleep, she rose, moved by some final urge and crossed to the transparent wall.

She touched it, her thin hand pressed against the clear barrier, and then her hand slipped through. She cried out in astonishment and then she understood. All that time of keeping up her strength and it was weakness she needed to escape! Enervated, she could go where a vital woman could not.

She slipped through the transparent wall and felt the wind engulf her. She was lifted and swept away from the Palace, skittering over the ground like a child skipping. It was delightful, it was pleasure too intense to be contained.

Nothing could imprison her again, nothing could stop her now. She was one with the West Wind that roared across the plains and pounded against the walls of jails.

HOW THE SEA WENT TO THE MOON

by
Joseph Patrouch Jr.

Once upon a time, long, long ago, the Sea and the Land got into an argument.

"I am much more powerful than you," said the Sea. "In time I can wear down any coast, move any rock, alter the outline of a whole continent. Yes, I surround you and shape you. I am your master."

The Land only laughed. "Why, the whole world was once under your complete control. Yet now I have removed you from great areas that once were yours, and you have been able to take back only a small portion."

The Sea rolled back and forth restlessly. There was too much truth in what the Land was saying.

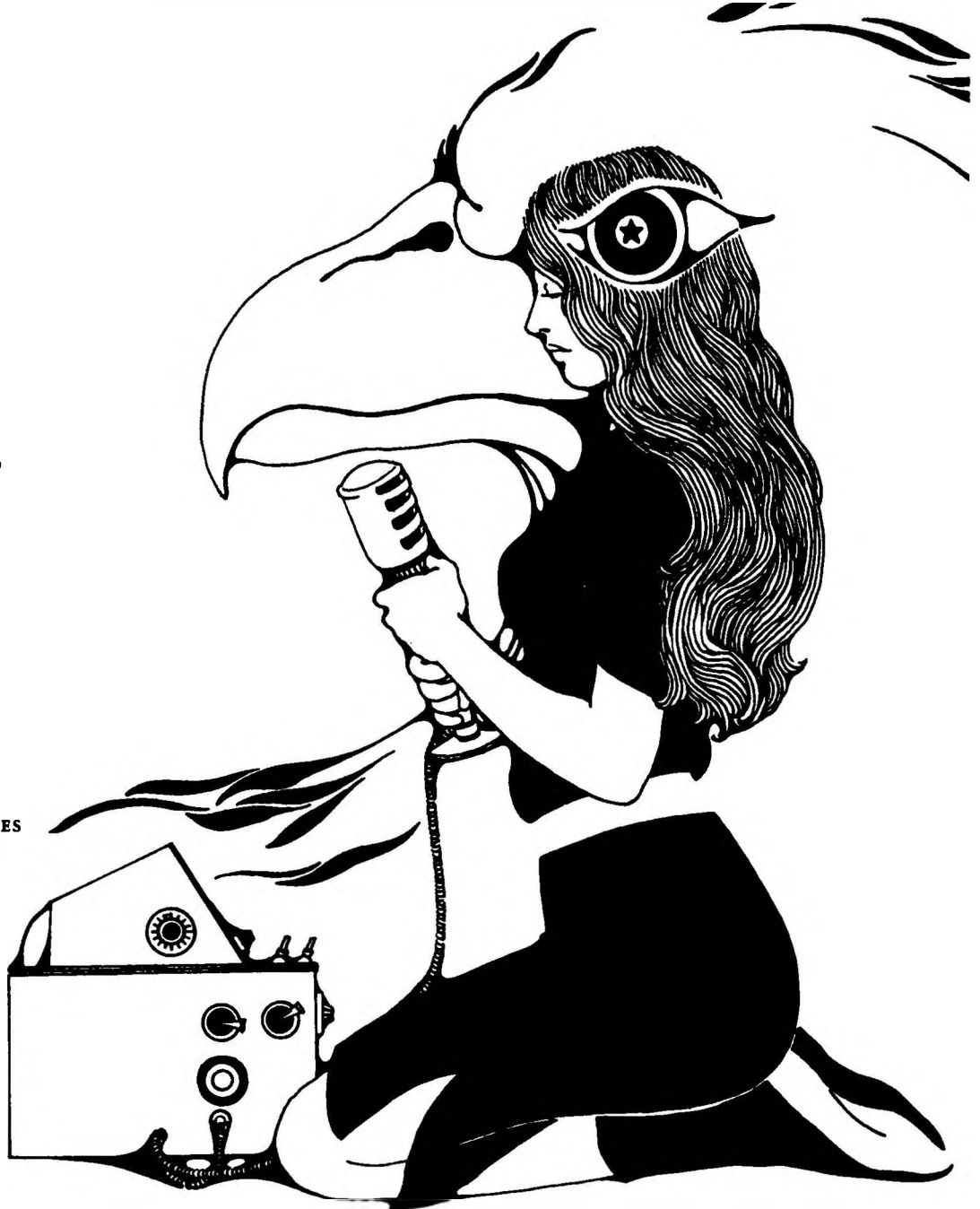
"And not only that, my old friend," the Land said maliciously, "but there is a part of me that you have never touched."

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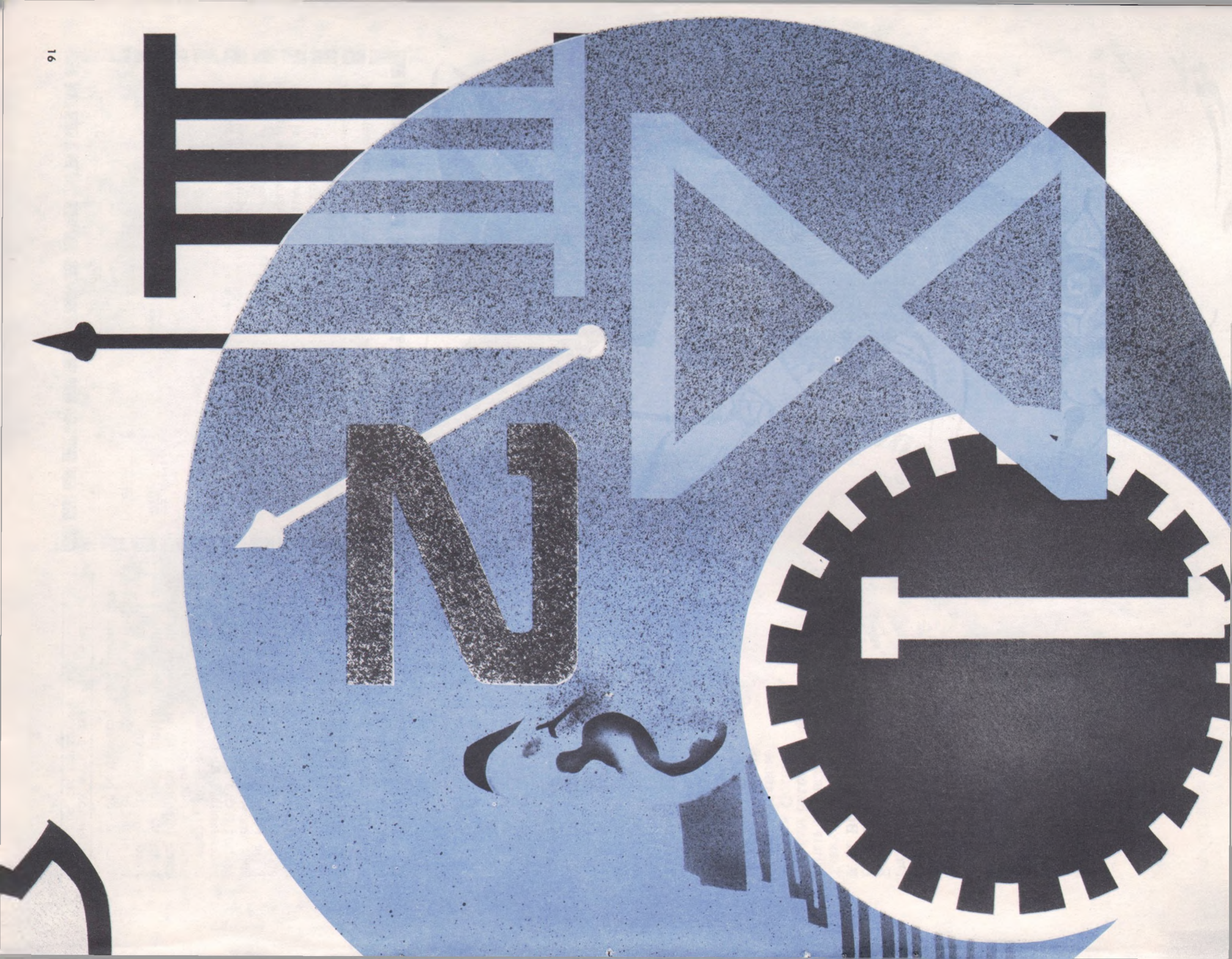
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The future taught him
more than he thought
he could learn, but
not more than he
wanted to learn.

HAYES AND THE HETEROGYNE

fiction/Ed Bryant
artist/Stevan Arnold

On November 22, 1963, a sixteen-year-old University of Denver student was run down and metaphorically killed by a speeding time machine.

By "killed," it is not meant he suffered a condition either literal or permanent. The student, whose name was Harry Vincent Blake, was effectively severed from his own here-and-now and transferred somewhere else. Somewhen else. That's death.

The odor of insulation burning.

A metallic, acid taste in the back of his throat.

The sound of a rip saw biting and binding in wet lumber.

He hadn't really been aware of the library's hushed ambiance. The musty scent of the stacks was too familiar to

consciously note. Vince Blake had been preoccupied, mentally reviewing again his notes in preparation for a quiz in his zoology lab. He stepped into the revolving door and put out his hands. His fingers touched nothing; he fell forward . . . and forward . . .

More like rubber tires aflame, the smell.

The taste in his throat was vomit.

The ripsaw whine found a companion set of harmonics.

Back in the Mary Read Library, no one had looked at the revolving door; no one had marked the entrance, or the lack of an exit. The girl at the checkout desk thumbed up the volume on the radio and startled faces turned toward her. "Oh my God!" someone said.

Tourmaline Hayes and Timnath Obregon had recently finished making love in the latter's laboratory. They lay loosely entwined on one of the broad tables in the experimental section, with the gear scooted down to one end to make a comfortable space. Obregon and Hayes were old friends who valued their intermittent, if often stormy, periods of companionship.

"Tired?"

"Sex with you is always such a celebration," said Obregon.

"That's what makes me a star," Tourmaline said. "Is it a criticism?"

"No, just a comment. Maybe a codification and reaffirmation."

"All that?" Her laugh was low and musical. She lightly ran her fingernails down the taut skin of his ribcage.

"Don't do that. I still have work to do."

"What's the project?"

"This week I'm inventing time travel."

She trailed her nails lower, along his belly. "Sometimes you're one of the most grandiose people with whom I've ever made love. You like to astonish me with revelations. Time travel, really?"

Obregon moaned something that could either have been assent or pleasure. He carefully detached her hand. "Really?"

She replaced her fingers and exerted small pressures. "Once, in one of my bored periods, I took an early morning Network course in temporal physics. The professor pretty much destroyed the case for practical time travel."

Obregon said distractedly, "That's the problem with popular science. No imagination." Again he brushed away her hand.

And again she replaced it. "I know.

That's why my curiosity occasionally brings me here to the Institute. Did you think I come merely for the benefit of your flaccid attentions?"

They both laughed. Obregon said, "Time travel exists. You see evidences of it all around you in Cinnabar."

"I do?"

He suddenly sat up, levering himself on bony elbows. "Look at the very nature of the vortical time streams that converge on the city. In City Center the time belts move appreciably faster than the belts further out toward the suburbs. The city is so huge, one doesn't always notice. But the difference becomes apparent when one moves from one belt

to another."

"Don't lecture me" Tourmaline said, giving him a cautionary squeeze. "That I can get from the Network."

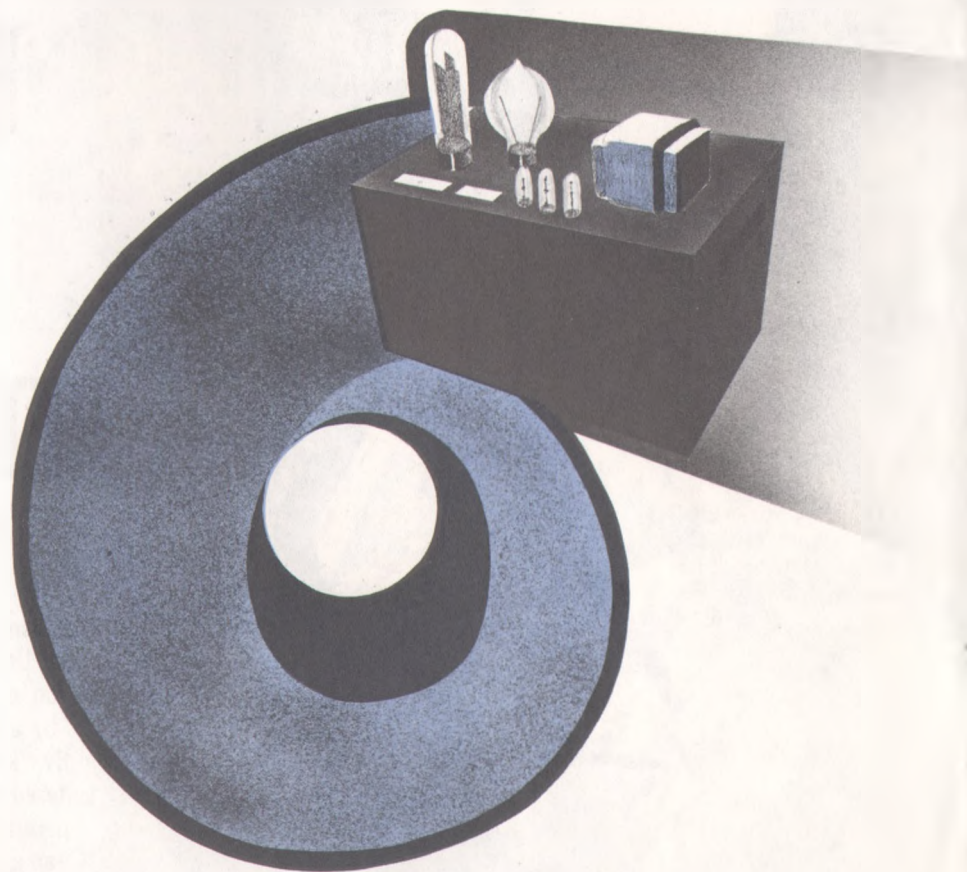
Obregon winced. "Sorry. Sometimes I forget I'm not a pedant anymore."

"Not officially. I suspect you amuse yourself in private by devising declamations."

"Listen, do you want to know about time travel or not?"

Mock-chastened, "Yes, I want to know about time travel."

"Then consider this. A person moving toward City Center on a straight line would effectively be approaching the future. Each concentric time belt toward



The machine that brought him to this strange future was not to be understood by men of any time. But he didn't really care, since it couldn't do the one thing he wanted it to do: Send him back to his home time.

the center would accelerate him forward."

"Toward what?"

"That's theoretical. At the precise center, presumably the final collapse and regeneration of the universe."

"All right, but that's not *time travel*. I'm talking about someone actually travelling into her own past or future."

"What I'm talking about is a matter of perspective," said Obregon. "I'm merely pointing out that time distortions exist right here at home where we can observe them."

"Don't be sulky," Tourmaline said. She bent forward and let her blue hair sweep slowly across his upper thighs.

Obregon mumbled something.

"What?"

"I suspect you're not really interested in time travel."

"But I am, Timnath." She put her hands on his shoulders and drew him inexorably down beside her. "I would enjoy travelling through time. How long before your vehicle is perfected?"

"I have no vehicle."

"Then—?" She straddled him carefully.

With resignation he said, "I'm running a time trawling experiment. This is the initial phase; actual time-traversing gadgets will come later. It takes time to erect a program."

"Doesn't it, though," said Tourmaline, situating herself. Obregon put his hands on her waist. "I'm disappointed. Then there's no beautiful gingerbread machine like the one about which I read in that marvelous Mr. Wells?"

"No." He let his fingers stroke along her flanks. "It's as though I've encountered a wide river but haven't invented the boat. I'm standing on the bank with ropes and grappling hooks. I can see debris washing by, and some of it I can retrieve from the shore. But I still can't venture out in my own craft."

Tourmaline contracted her muscles and felt his back arch in response. "That's an awful metaphor. The professor on the Network program said that comparing time to a river was the oldest cliché in temporal mechanics."

Obregon made gasping, pleased noises.

"Articulate, Timnath."

"I said use any simile you like. Time fits almost any image you can think of. Oh. *Ohhh.*"

"Time is like . . . the water vanishing down a sink drain."

"Banal." He lifted his hands to cup her breasts. "Basically correct, but too ordinary."

"Time is like . . . a ripe, spotted banana."

"Don't be silly."

She began to laugh. "Time is like . . . a frog's tongue."

Obregon's distracted features composed for a moment. "That's right. That's truly accurate. How did you know?"

"Know—what?" said Tourmaline. Her eyes looked at him but they were not focused.

Obregon rocked beneath her. "You know," laughing, breath hissing between clenched teeth, "you know you know."

Beyond them, a bell chimed softly.

"It worked!" Obregon tried to sit up, bumping his forehead against Tourmaline's chin. His expression was suddenly intent.

"*What are you doing?*"

The bell chimed again, three times. "It *worked*." Obregon disengaged himself, swinging one leg down off the table.

"Timnath, you—" Her voice shook. "You *fool!* What—"

He grabbed her hand and nearly dragged her from the table. "Come on, it's the alarm. Something in the time stream—my devices have locked onto it."

"Timnath!" Her voice approached a wail.

They stumbled across the laboratory. "We may have captured the first time traveller," said Obregon.

"Fuck," said Tourmaline.

Vince Blake fell through the pearl-gray medium which had no other identifying sensory characteristics. It was neither warm nor cold, with no odors and no sounds. The only thing to watch was his companion, the two by three-foot breadboard assemblage, winking and sparkling its circuitry atop a cubical black box. Vince had no idea what the machine was, though he'd spent considerable time speculating. The machine orbited him slowly; but its perigee was about a yard, and that was not close enough for Vince to reach across the intervening space.

Subjective time dilated.

27. (Q) The process of sexual reproduction in the genus *Paramecium* is called _____.

(A) Conjugation.

His spatial orientation was minimal; confusion stymied attempts to assign labels to up or down or sideways. Yet Vince knew he fell. He had tried skydiving the previous summer and this was how it felt, though without the rush of wind tearing at his clothing. *Free fall*, he thought. *Is this how it was for Colonel Glenn?* But free fall in—what? English

412, last quarter. He recalled Alice's interminable tumble down the rabbit hole.

79. (Q) Why does the male opossum have a forked penis?

(A) Because the female has two vaginas.

Vince's sense of time was stalled. Occasionally he checked his watch, but the hands inevitably remained poised at 11:28. He couldn't remember whether it had been morning or evening.

192. (Q) The primary male hormones are called _____.

(A) Androgens.

Something important remained with him—the constant, nagging knowledge of the importance of this afternoon's zoology test. He had slacked off the past few weeks . . . Karen . . . his grade hung in precarious balance. In his mind he created questions and answered them. Endlessly.

460. (Q) What characteristic do female cats and female rabbits have in common when they are in heat?

(A) They are both spontaneous ovulators.

And all the while, further back toward the rear of his skull, mental Muzak endlessly replayed the Cascades singing: "Listen to the rhythm of the falling rain." He speculated whether he might have died and gone to hell.

1,386. (Q) True or false: a male porcupine must urinate on the female to make her sexually receptive.

(A) "True," he said aloud, but heard the sound only because the vibrations travelled from his larynx to his ears via the intervening tissues and bones. Sounds coming from his mouth were damped as soon as they tried to penetrate the gray space. It gave him a spooky feeling.

1,387. (Q)—

Piss on it, he thought—and remembered question 1,386. He grinned, and then thought of Karen, and then dove headlong into depression. It was not a novelty. Karen had sat beside him in the afternoon functional anatomy section for nearly a quarter now. He had hardly dared speak to her except for the Friday she forgot her pen and asked to borrow one of his. Karen was beautiful, nineteen, and, for Vince, unapproachable. For the entire quarter she had starred in his masturbatory fantasies. Virgin dreams.

Before Karen there had been a round-faced brunette with slow, sleepy

Tourmaline and Timnath taught him more about life than he was prepared to learn, at least in that time.

eyes named Angela. English 412. Vince had hesitantly asked her to accompany him to the Homecoming Dance. She had turned him down ungracefully. She had laughed. *Would I date my little brother?* To her it was a minor matter and she never noticed when Vince moved for the remainder of the quarter to another row. Vince remembered and brooded and hurt. Increasingly he regretted his being sixteen and precocious. Pubescence was difficult.

Vince wondered what it was like to make out.

It seemed to be infinite, the number of Friday nights he had walked through the dormitory lobby on the way to see a movie alone. The lobby was always crowded with guys waiting to pick up their dates. All the swim team jocks from New York and the baseball jocks from southern California. Vince watched them laugh and be cool and he wondered what it was like. This fall the big catchword in from the coasts was 'bitchin'. Whenever Vince tried to use topical jargon he sounded unsure and pretentious. But since he talked to few people, perhaps it really didn't matter.

Bitchin'.

He was aware of a change in motion. He had the feeling that the alteration had been building up for some time before it was sufficiently large to notice. He still fell, but now there was a lateral force; it tugged with a steady, insistent gentleness. Physics 532, but before that, of course, Cherry Creek Junior High general science: *a body in motion tends to remain in motion unless a force is applied*. Simple. He could detect no cause for the new force. The machine with its breadboard components still circled him silently, no change in its measured orbit.

Vince felt a wave of nausea. He shut his eyes and swallowed and when he opened his eyes again, he stared. He was circling the lip of a cosmic funnel.

He felt as though he were looking miles down the inside wall of the funnel. No longer uniform, the gray lightened to a metallic sheen as it descended, then brightened to a point of painful brilliance far below in the center. Vince's eyes skipped across that point; it was like looking at the sun. His eyes watered with dazzle images.

English 412 again; Edgar Allen Poe. This was the brink of the Maelstrom. He felt himself to be an infinitesimal chip about to launch into the huge whirlpool. There were no referents; he realized he could not realistically estimate the size of the vortex below.

He saw a few dark dots on the near side of the funnel; they moved clockwise, relative to his own position. *Other flotsam?* He wondered whether they were people or machines or something else.

The lateral force pulled harder. Pain cramped in his belly. He cried out and, as before, the sound died at his lips. He felt a wave of vertigo and knew he was sliding into the pit.

And it was at that point that the pain blossomed out like a metastasis and the gray darkened to black.

When Vince awoke, two nude people were standing over him. It was the first time he'd ever seen a naked woman in the flesh.

Obregon hunkered down and touched the boy's right wrist with his fingers, seeking the pulse. "How are you—do you feel all right?"

"My stomach . . . hurts." The boy's eyes focused on Tourmaline for a moment, then looked quickly away.

"This is a time traveller?" said Tourmaline. "He's so young."

"Nausea?" said Obregon.

The boy nodded.

"With luck, that will be the worst of it." Obregon obtained a glass of effervescent liquid from the chemical console and returned to the boy's side. Tourmaline helped prop the boy's head so he could drink. Obregon took the empty glass away. "What's your name?"

"Vince. Harry Vincent Blake. Where am I?" He struggled to sit upright. "Is this a hospital?"

"This is a research laboratory at the Tancarae Institute."

"Where's that?"

"Near the suburbs of Cinnabar."

Vince said confusedly, "I was in Denver. What happened? Where's Cinnabar?"

"Timnath," said Tourmaline, "he won't look at us. What's wrong?"

Obregon said, "I think we've snagged a prude out of the time stream. Vince, does it upset you that we're naked?"

Vince's face was fiery. He mumbled something.

"How strange," said Tourmaline. "I'd better get our clothing."

Vince glanced at her and his flush improbably deepened. Tourmaline shook her blue mane in disbelief and walked away. Vince watched her swaying hips retreat. Turning back to Obregon, he repeated, "What's happened?"

"I'd hoped you'd be able to supply me with some of those details," said Obregon. "You've been travelling." He

pointed toward the black box crowned with the breadboard circuitry. "That brought you."

"What is it? When I started—it just seemed . . . to appear."

"It's your time machine, of course."

Vince looked bewildered. "It's not mine. I don't know what it is."

"I just told you—it's a time machine. Didn't you build it?"

"No."

"Were you merely an experimental subject for the inventor?"

"No. I told you I—"

"—Am quite ignorant, I'm sure. This is indeed strange," Obregon said.

Tourmaline reentered the laboratory clad in a knee-length sapphire shift. "I hope this is modest enough." She tossed Obregon a brown, rough-woven garment.

Obregon wound the fabric around his waist and tucked in the loose end. "Do you know what a time machine is?" he said to Vince.

"I've read science fiction, but I know time machines are impossible."

"I think we've been through this," said Tourmaline.

"Just accept my word that they're possible," Obregon said. He circled the black box, examining it. "Unsophisticated. Apparently jury-rigged." He bent closer. "There's a metal plate screwed to the top. 'Property of Physics Department, Central Texas College of Science.'" He looked at Vince. "Is that where you came from?"

"I never heard of it. I'm a student at the University of Denver."

"Where's that?"

"Colorado."

"Never heard of it." Obregon probed gingerly at the electronic components. "Surely this must have been a prototype."

Vince took a deep breath. "Is this the future?"

"Not for us."

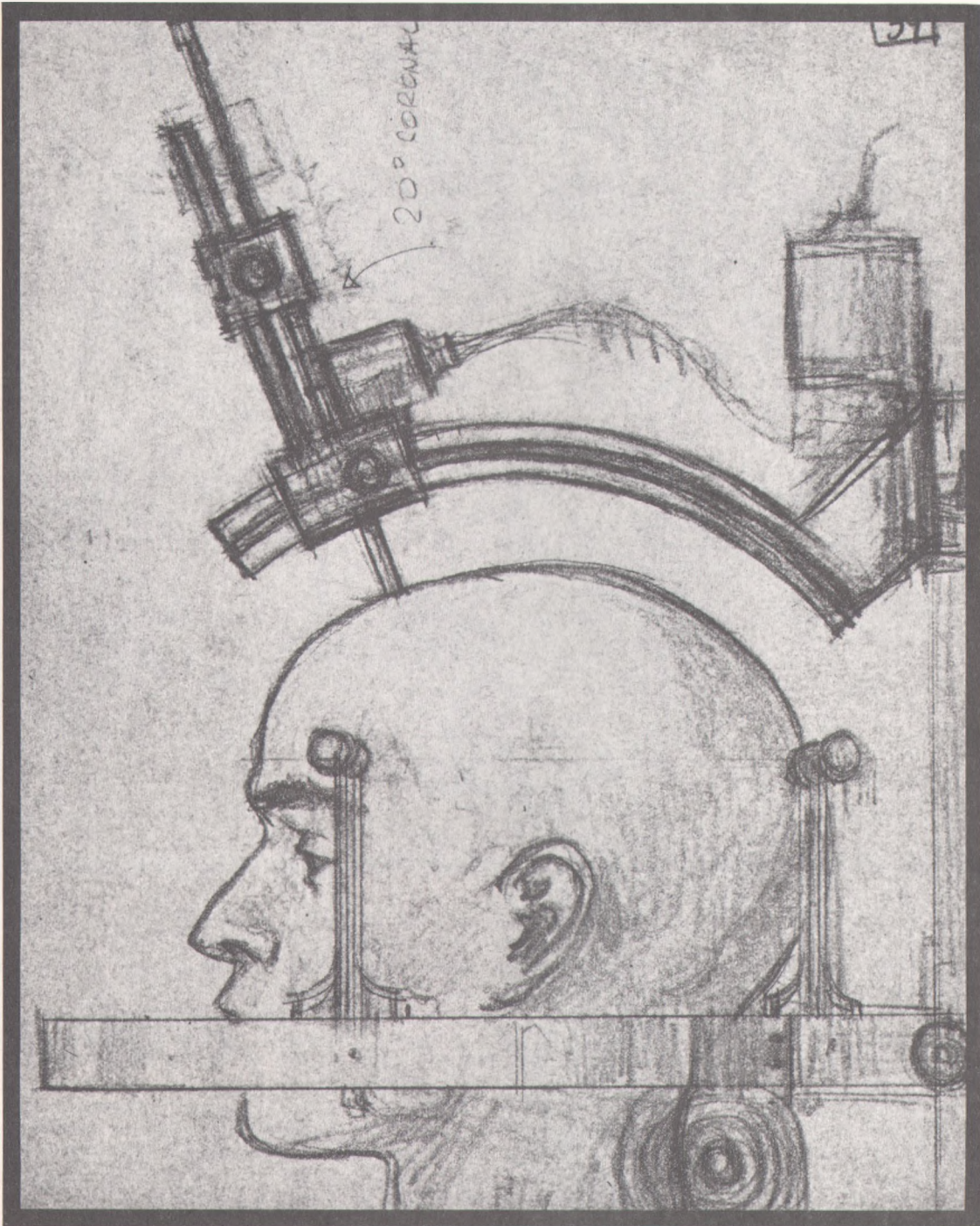
"You're talking like the people in *Alice in Wonderland*." His voice and body trembling, Vince stared wildly between them. He choked on a sob.

"Baby, poor baby." Tourmaline gathered him into her arms; he pressed his face between her breasts, his back shaking as she soothed him with her fingers. "It's all right, go ahead and cry. You're all right and we're your friends." She said reproachfully to Obregon, "Give him some simple answers."

"There's no way for him to avoid cultural shock." She continued to stare at him and finally Obregon said, "I don't

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For good or ill, the techniques of both thought and personality control through surgery are now being developed, as this new Warner Brothers film shows.

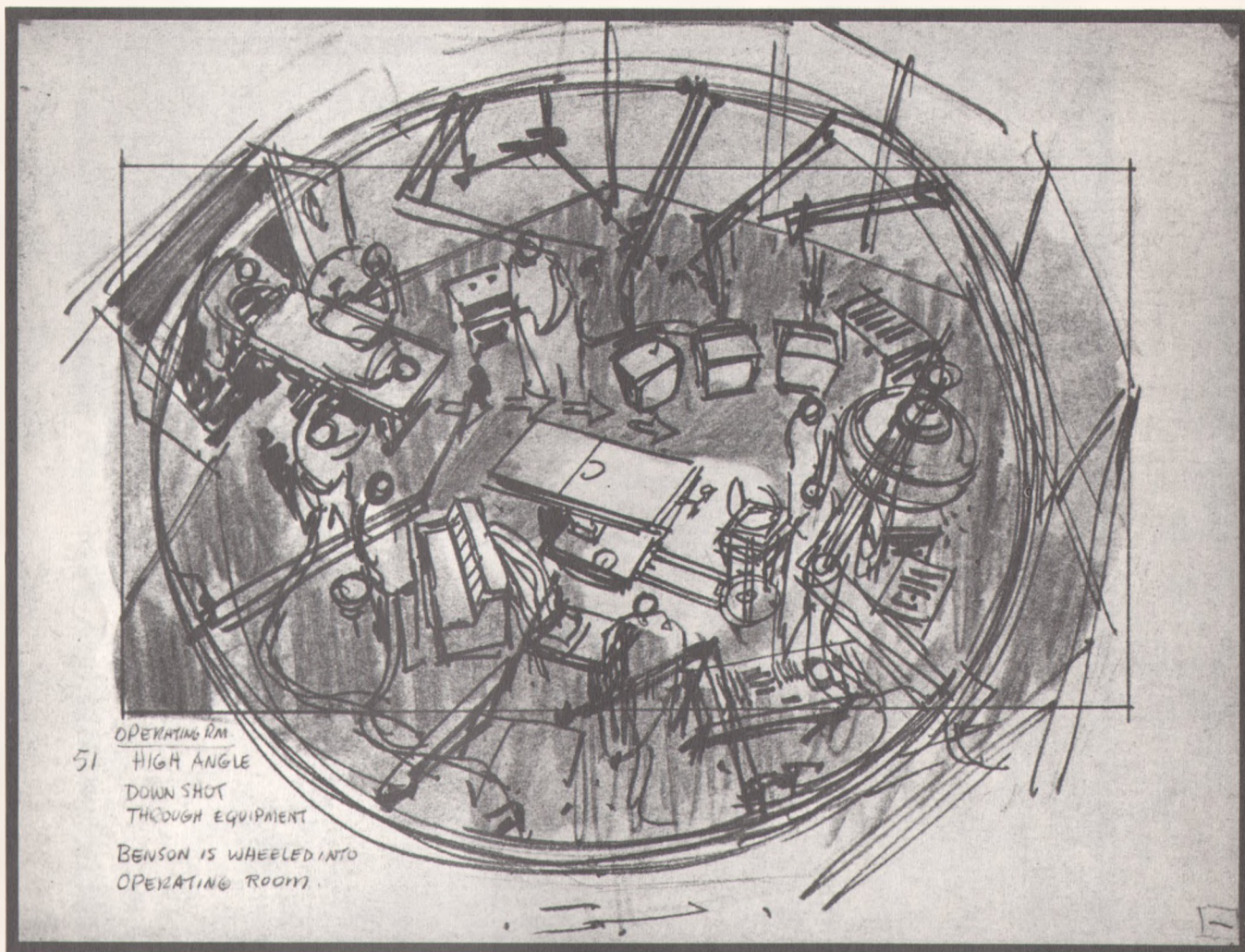


THE TERMINAL MAN

article/Harlan Ellison

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Warner Brothers built the complete operating room of the future for their new film, directed by author (and Doctor) Crichton.



“Madness has become man’s possibility of abolishing both man and the world—and even those images that challenge the world and deform man. It is, far beyond dreams, beyond the nightmare of bestiality, the last recourse: the end and the beginning of everything. Not because it is a promise . . . but because it is the ambiguity of chaos and apocalypse . . .”

Michel Foucault,
MADNESS & CIVILIZATION

On an unseasonably sweltering evening in May of 1966, Baton Rouge was jolted out of its personal discomfort by one of the strangest murders ever recorded in that city. A thirteen year old boy named Judson Lagrange, for no apparent reason anyone could discern, murdered his mother. Not simply in an act of passion, but over and over again as though driven by a terrible, inexplicable compulsion: using a .38 S&W Webley English Service Revolver left behind by the father who

had deserted him and his mother six years earlier, the boy had fired the first shot, utterly and finally fatal, straight into his mother’s heart; the woman died instantly, but the boy—as he recalled the event later—felt as though he was emerging from a long dark night—he was unable to recall the events leading up to the slaying—and he stood there, swaying, ever so slightly, as something within him compelled him to notice the revolver was now empty, though only one shot had been fired, compelled him to go to the drawer where the gun had lain unused for years, compelled him to reload the chambers of the weapon, compelled him to carefully check the gun for readiness, and, finally, compelled him to stand over the corpse and fire six more shots into the dead woman.

When the firing pin clicked on an empty chamber at last, he set down the revolver, went to the sofa across the room from the corpse, sat down, and quietly waited for the police to come for

him. He was unable to give a reason for his act.

In no way connected to the life of Judson Lagrange save by a formidable thread of mental illness, four years and two months later, halfway across the continent in New York City, a fifty-two year old man who had signed the guest register of the cheap midtown hotel into which he had checked the week before as Walter M. Dickinson, awoke with a scream of terror and disorientation. Awoke, as he put it later, “like I was coming out of a long, dark sleep.” He lay in the bed, wrapped in sweat-soggy gray sheets, staring up at an unfamiliar ceiling, staring around at unfamiliar walls, staring out a window on a city he had never before seen. He did not recognize the room in which he had lived for a week, did not in fact recognize the hotel, the city, the name he had signed, or even the clothes he had clearly been wearing.

An entire week had been erased from

On leave from the Salk Institute for Biological Studies, Michael Crichton puts an inevitable ring of truth into his novels.

his memory.

Shaking with disoriented fear, he remanded himself into the custody of the New York Police Department and, through the Missing Persons Division he learned that for seven days he had been gambling heavily, living on his meager winnings, had been frequenting Time Square movie houses till the small hours of the morning, and had been frequenting Times Square prostitutes when he was not clothed by the darkness of the theaters.

None of this was consistent with his past. His real name was Paul Robinson, he lived in Columbia City, Indiana, he had a wife and three children, and for thirty years had been a salesman of religious articles throughout the Midwest. He had never touched a pack of cards in his life, had been a faithful husband and father, had been a regular churchgoer and was not particularly fond of motion pictures.

He was never able to explain why or how he had gotten from Indiana to a flophouse in Manhattan, nor why he had done it, nor what had transpired during that vanished week.

He was sent home to his family and the pattern never repeated itself.

Both of these unfortunate human beings, the teen-aged matricide and the fiftyish amnesiac, were finally diagnosed as suffering from a strange, little-understood affliction known as psychomotor epilepsy.

Even in a time of bypass surgery, transplants, artificial stimulation of brain centers and Pacemakers, this comparatively rare offshoot of the more common group of diseases commonly termed "epilepsy" is one of the most baffling, mysterious and potentially dangerous ailments known to medical science. And though its dramatic symptoms have drawn widespread attention in medical journals both here and abroad, still . . . with case histories like the above reported regularly . . . virtually no breakthroughs have occurred in diagnosing and curing. Truly, those suffering from psychomotor epilepsy are the damned of our time.

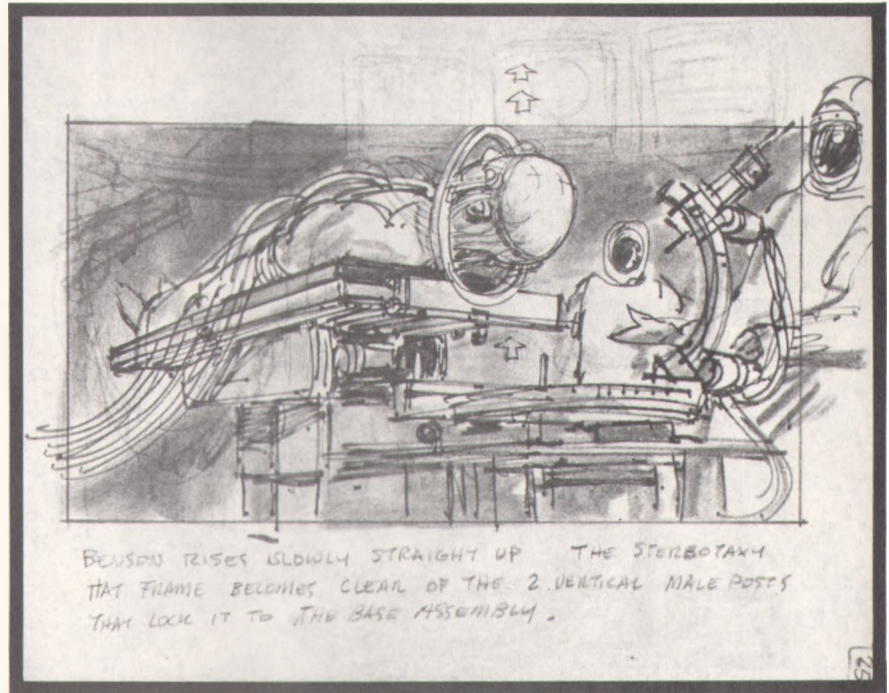
And with that peculiar fascination for minutiae in the various sciences that has fascinated writers of the imaginative since Wells first supposed "what if," it has fallen to the genre of science fiction to come up with the first extrapolative consideration of psychomotor epilepsy in human terms.

First as a brilliant and suspenseful sf

novel by Michael Crichton—whose *THE ANDROMEDA STRAIN* and *BINARY* have placed him in the forefront of mainstream novelists utilizing the rigors of the sf idiom to full effect—and now on film in a startling adaptation of the Crichton book, psychomotor epilepsy becomes more than a conversation piece for idle conjecture at medical conventions. In *THE TERMINAL MAN*, science fiction blends with a deep con-

human dilemma. With the rare magic that the motion picture idiom brings to certain special works of the imagination, *THE TERMINAL MAN* not only scintillates with the suspense and drama of the pure sf "hard science" story, but probes deeply into the aspects of what Faulkner termed "the human heart in conflict with itself."

Judgment of the sf community on the implied classic stature of this film is yet



cern for the human condition to produce a film that *aficionados* cannot help but view with admiration and excitement.

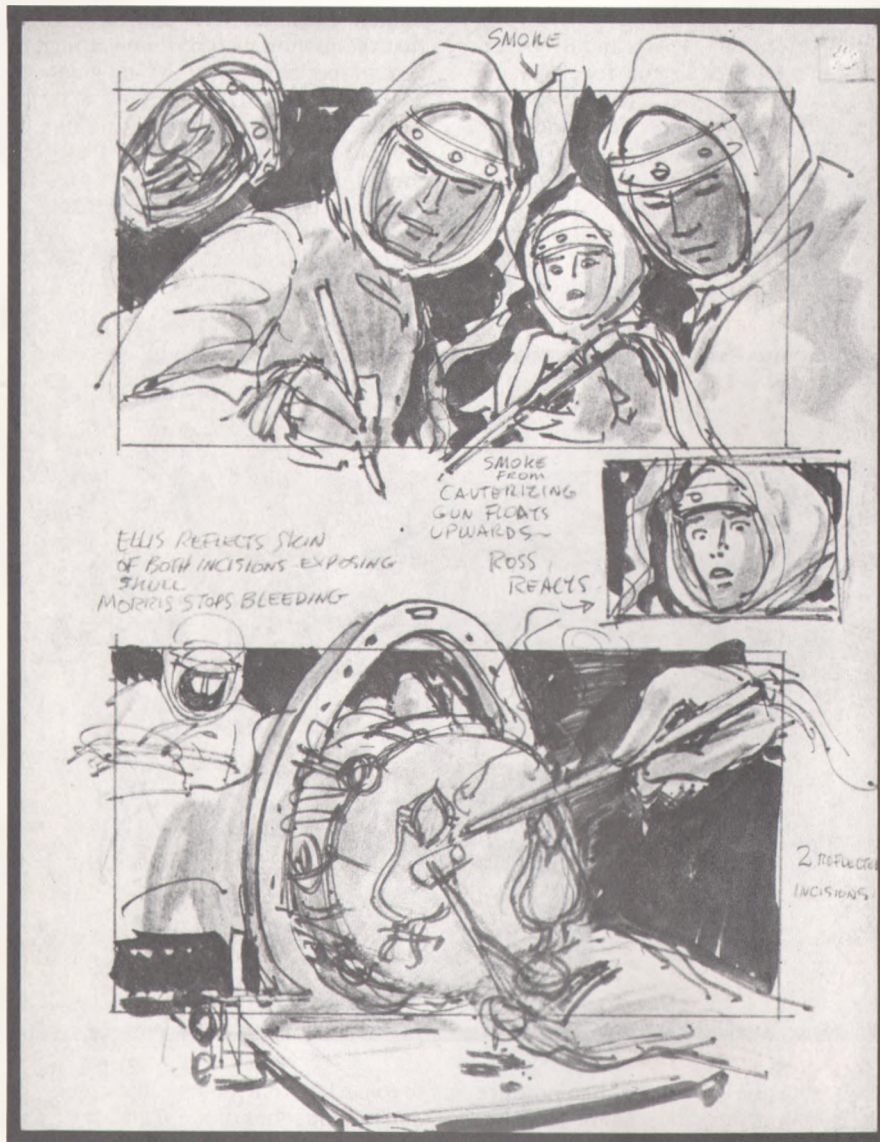
As set forth in Crichton's bestselling novel, an experimental technique for treating the disease is postulated that would control the devastating symptoms utilizing futuristic surgical techniques that, at present, exist nowhere outside the fertile imagination of Crichton (who was educated at Harvard College, Harvard Medical School, received his MD in 1969, and is currently on leave of absence from the Salk Institute for Biological Studies in La Jolla, California). Brain controlling mechanisms implanted inside the body are only one element of this fantastic therapy.

And even as adventurous as Crichton's original conception may have been in the novel, it is Warner Bros.' film of the novel that most perfectly examines this extrapolative consideration of the consequences inherent in combining man and machine to solve an insoluble

to come, but from preliminary screenings and examinations of the sketches for the hardware used in the motion picture (which accompany this article exclusively here in *Vertex*), it seems safe to say that Crichton, producer-director-scenarist Michael Hodges, and Warner Bros. have brought forth a visual feast that will rank beside 2001: A SPACE ODYSSEY, THE DAY THE EARTH STOOD STILL, THE TIME MACHINE and THINGS TO COME as a milestone of memorable science fiction.

"The electromotive force, such as arises when tides of ions play across magnetic lines, like the bowing of violin strings, has its counterpart in the human brain and nerve cords where comparable vibrations create 'brain waves' that can be tuned in on, measured and interpreted by man. The electroencephalograph, for instance, records the brain's tides and weird melodies: the alpha rhythms 'resembling a scanning device,' the delta

Accuracy and honesty are the keynotes of this new film, and it's guaranteed that the realism will impress your total senses.



waves' 'billowy rhythms of sleep,' the theta rhythms evoked by repulsion and disappointment, the kappa waves that are most active when cerebral 'wheels are grinding' in a conscious effort to remember. Can it be of less ultimate meaning that epilepsy is being successfully treated as 'a temporary electrical storm in the brain,' a cross-circuit of billions of neurones?"

Guy Murchie,
SONG OF THE SKY

If it be true, as it has been said, that the history of human civilization is a record of the diseases with which humankind has had to contend, then epilepsy is surely as old as recorded civilization itself.

Perhaps even older: the earliest chronicles of western culture frequently

refer to men being possessed by gods, demons, devils, imps . . . behaving oddly . . . the legends of soul-stealing, demonic transference, the "amok" . . . and a general acceptance exists among historians that these are bastardized accounts of men, women and children stricken with epileptic seizures.

Even the sophisticated Greeks associated epilepsy with the supernatural or paranormal world; and thus the disease, totally misunderstood, was integrated into much of their religious rituals.

What amusing little creatures we are, always seeking some new and all-encompassing overview that will explain the ethical structure of the universe. From Anaxagoras's belief that the world was round, through time to Nietzsche's theory of the *Übermensch*, to Darwin's origin and descent, to Velikovsky's col-

liding worlds, to the space visitors of Von Däniken and Duncan Lunan's alien space probe that's supposedly been in orbit with our Moon for thirteen thousand years . . . not to mention the world-views of the Maharishi, Guru-ji and the John Birch Society . . . humans have always sought to explain away the unknown with wild fantasies. Usually paranoid.

So, too, did the ancients try to explain epilepsy.

One of the most familiar was the Delphic Oracle, to whom kings and conquerors and commonfolk went to learn of the future. Because of the supposed liaison between epileptics and gods, "the epileptic may be felt to have gained supernatural insight into the future as a result of his intimate relationship with the supernatural," according to Isaac Asimov, in *THE HUMAN BRAIN*. Thus, if the poor Oracle had an epileptic seizure, it would be unarguable proof positive that the prophecy of such a seer was direct from the Fates themselves.

The first person to rebel against such nonsense was, not surprisingly, Hippocrates of Cos, the father of medicine. Hippocrates ventured that, far from being of spiritual origin, epilepsy was organic in nature. Of Hippocrates's conviction, essayist Gustav Eckstein wrote: "Epilepsy, he insisted, ought not to be called divine. There was no divinity in it.

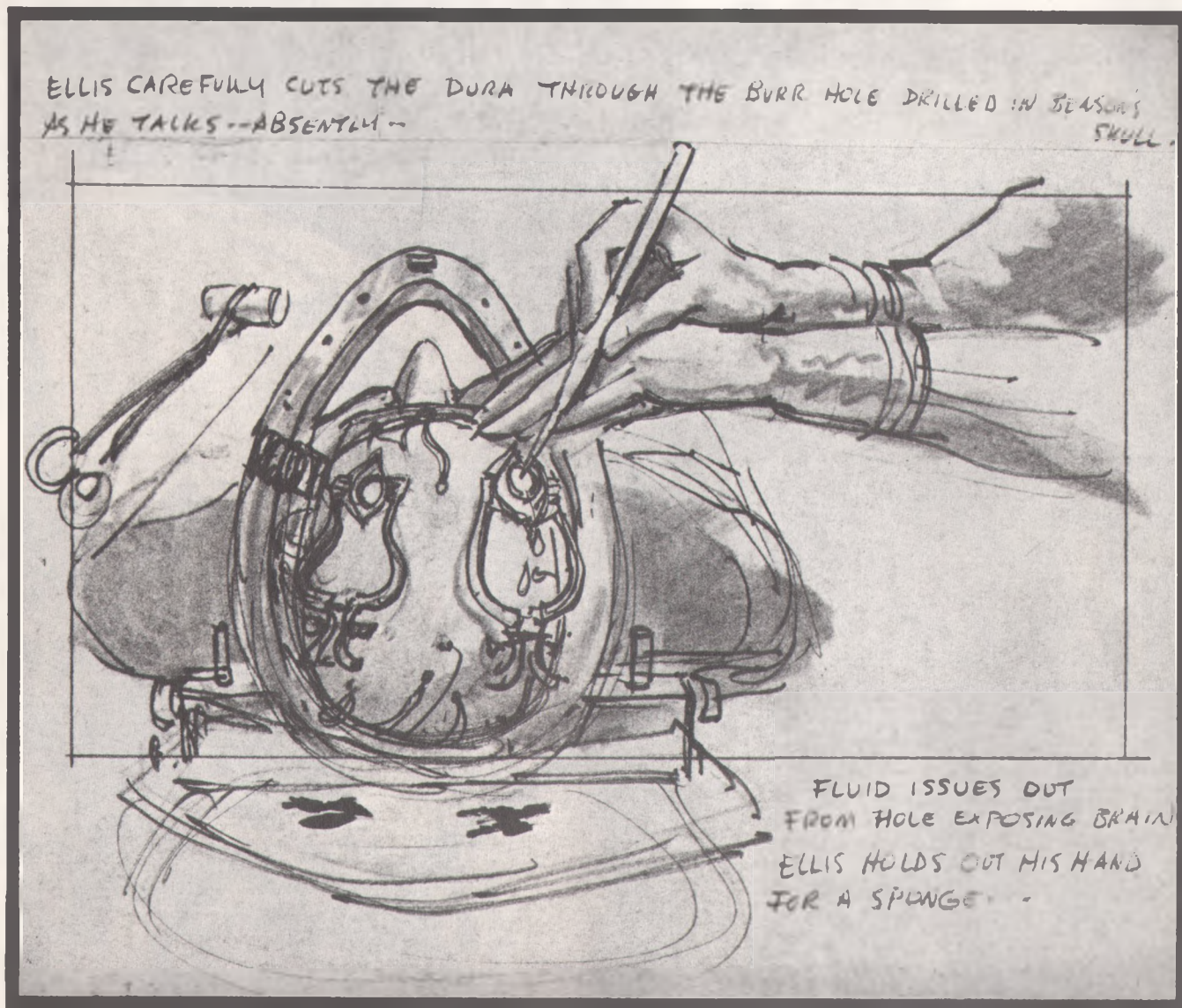
It was a disturbed brain.

With a single sentence, Hippocrates stripped away uncounted centuries of superstition and inhumanity and ignorance, thus striking in the direction that has led to the modern medical practice of applying inquiry, logical thought processes and a heightened sensitivity to the problem of bodily ills.

But the first successful treatment of the disease had to wait till the early part of this century—until which time epileptics were thrown into Bedlams so "the madness would not return to the village"—and with the rise of pharmaceutical technology sophisticated surgical techniques and advanced forms of drug therapy were brought into common use.

Modern medicine now recognizes three forms of epilepsy: *grand mal*, where seizures manifest themselves as bodily convulsions and loss of consciousness (a plot pivot in Crichton's *THE ANDROMEDA STRAIN*); *petit mal*, marked by very brief unconscious periods; and . . . *psychomotor epilepsy*, in which various kind of "automatic actions" may occur during extended amnesia, or long blackouts like "a long,

Tampering with a man's brain may still bring forth moral questions, but there's no doubt the surgical techniques are now available.



dark night" of troubled sleep.

Clearly, the psychomotor variety is the most difficult to treat. It is generally resistant to anything but the most powerful chemotherapy, or drastic surgery, such as the pre-frontal lobotomy. However, while both forms of treatment render the patient "acceptable" to the society in which he must live, imprisoning his sociopathic tendencies, they also have the most undesirable and repellent side effects. Drugs able to unravel the twisted processes of a disturbed brain cause total impotence. Old-style lobotomies result in a "flattening of the mind, a bleaching" to use Eckstein's vivid phrase. The lobotomized become *overly* tranquil, frequently too free of ambition or motivation to compete with others in even the smallest fashion. They sink into apathy. They become zombies, little

better than living vegetables.

Recently, an updated method of lobotomization was proposed to cure a "John Doe"—confessed rapist and murderer—held in the Ionia State Hospital near Detroit for eighteen years. Early this year, several doctors secured permission to operate on "John Doe," utilizing a special surgical technique that was alleged to destroy only the minute brain structure known as the amygdala, a switching point for sexual and aggressive impulses. The prevailing opinion was that this operation would reduce the patient's violent sexual tendencies while avoiding the gross side-effects resulting from a normal lobotomy in which relatively large areas of the brain are excised.

Before the "John Doe" operation could proceed, however, a legal battle developed over the ethics of the experi-

ment, eventually lengthening into an extended debate over what was seen as blatant "mind control." The concurrent revelations at that time of ghastly experiments using blacks in illegal studies of venereal disease in Alabama prisons only served to deepen concern over the propriety of the operation.

A court decision killed the operation, and, apparently, any future attempts at altering personalities by removal of portions of the brain. Accordingly, research is now concentrated on the control of antisocial behavior stemming from organic brain dysfunction not by tinkering with the physical structure of the brain, but by reorienting the impulses that cause such malfunctions.

But even the most liberal proponents of corrective brain surgery admit that in

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They were to give man a new start, so only the best of man's millions would be allowed to go.

fiction/HERMAN WREDE
artist/RODGER MACGOWAN

THE SEEDLINGS

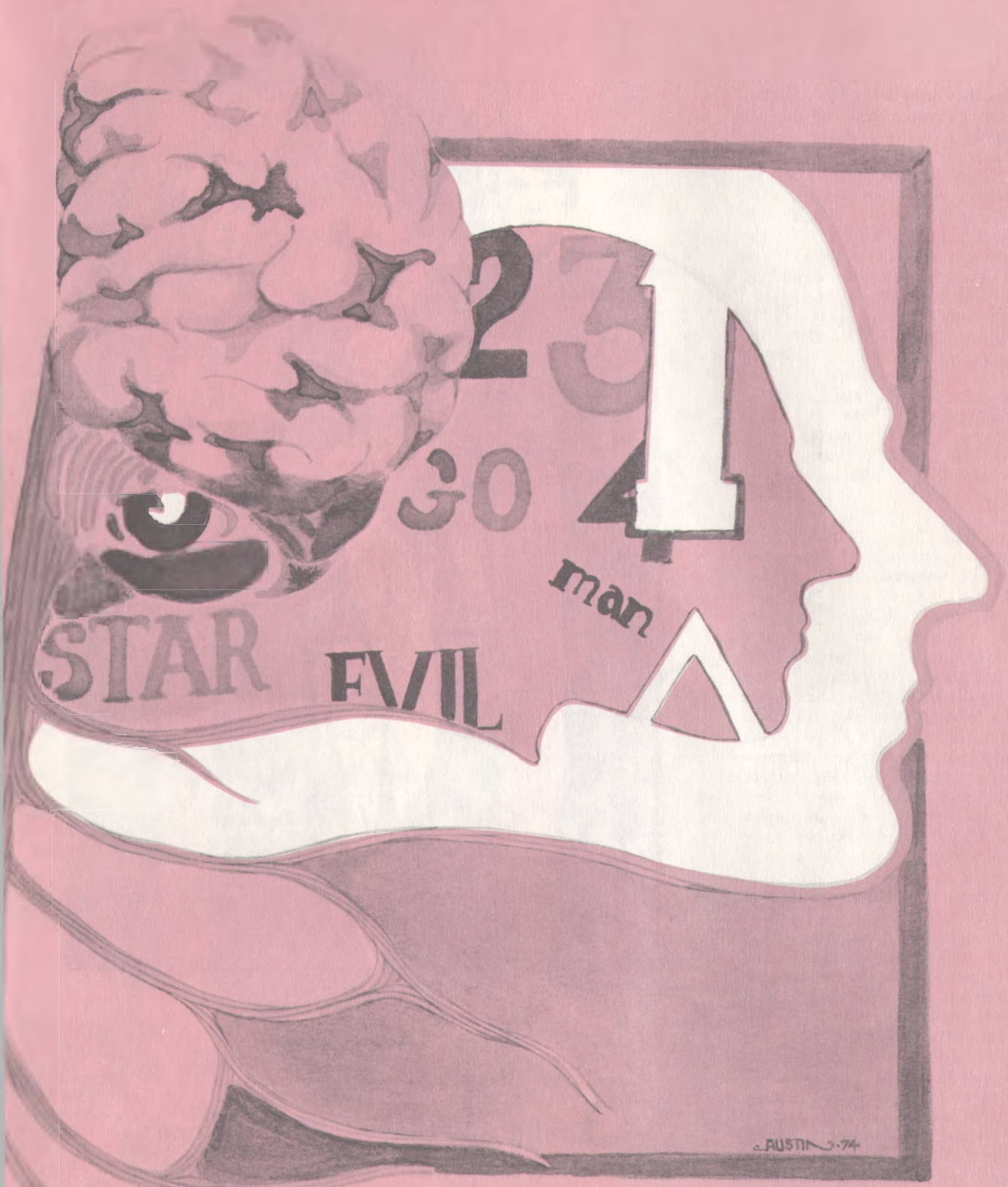
This is a proud moment for you all, as well it should be. I hope it is also a grave one."

The six couples around the conference table waited for Professor Grayson to continue.

"Steiner—Li—Valade—Heckman—Hallon—Rostov. These names will live through the ages, long after Earth has

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They came to the house as children,
but left as saints or madmen.

IN THE HOUSE OF DOUBLE MINDS

fiction/Robert Silverberg
artist/Alicia Austin

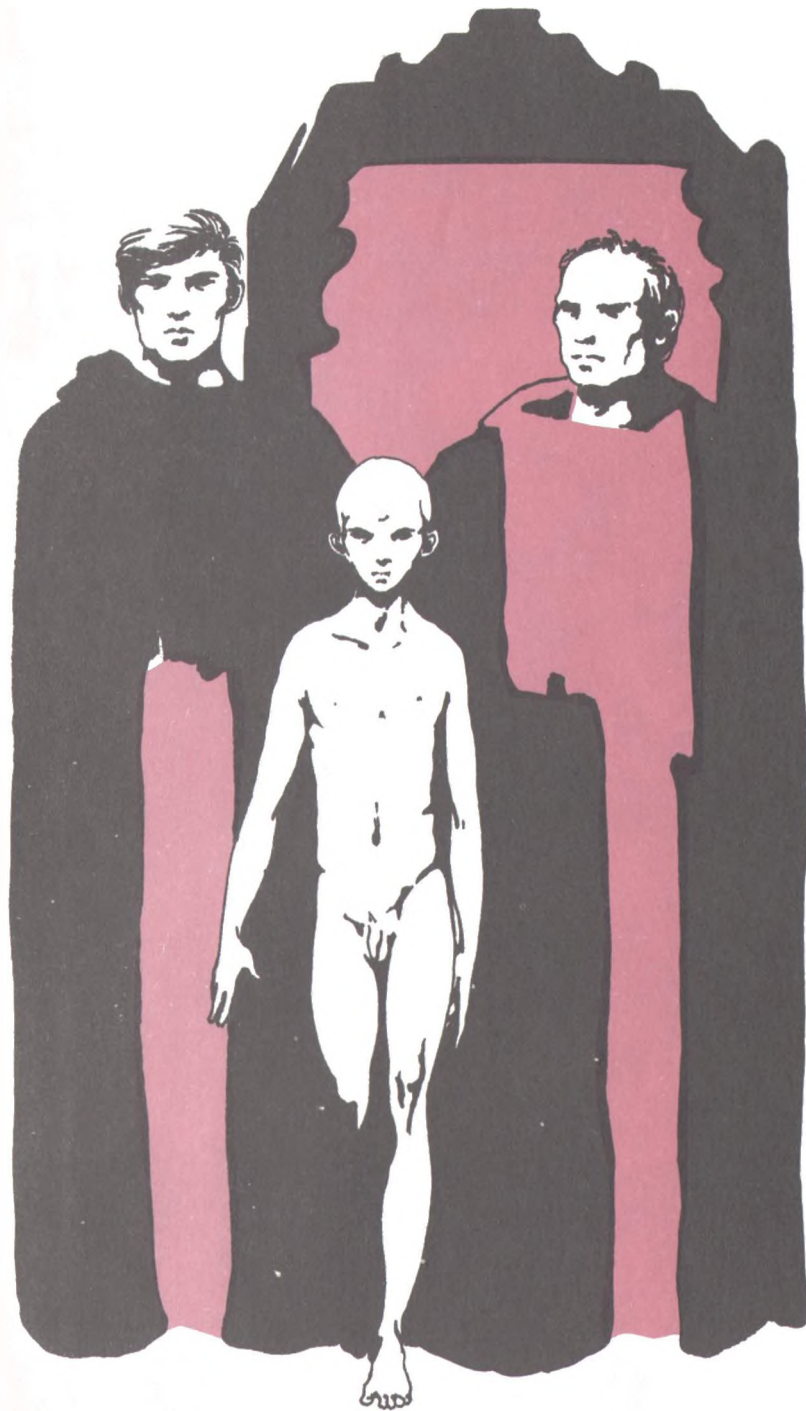
Now they bring in the new ones, this spring's crop of ten-year-olds—six boys, six girls—and leave them with me in the dormitory room that will be their home for the next dozen years. The room is bare, austere, with black slate floors and rough brick walls, furnished for the time being with cots and clothes-cabinets and little more. The air is chill and the children, who are naked, huddle in discomfort.

"I am Sister Mimise," I tell them. "I will be your guide and counselor in the first twelve months of your new life in the House of Double Minds."

I have lived in this place for eight years, since I was fourteen, and this is the fifth year that I have had charge of the new children. If I had not been disqualified by my left-handedness, this is the year I would have been graduated into full oraclehood, but I try not to dwell on that. Caring for the children is a rewarding task in itself. They arrive scrawny and frightened, and slowly they unfold, they blossom, they ripen, they grow toward their destinies. Each year there is some special one for me, some favorite, in whom I take particular joy. In my first group, four years ago, it was long-legged laughing Jen, she who is now my lover. A year later it was soft beautiful Jalil, and then Timas, who I thought would become one of the greatest of all oracles; but after two years of training Timas cracked and was culled. And last year bright-eyed Runild, impish Runild, my pet, my darling boy, more gifted even than Timas and, I fear, even less stable. I look at the new ones, wondering who will be special among them for me this year.

The children are pale, slender, uneasy; their thin nude bodies look more than naked because of their shaven skulls. As a result of what has been done to their brains they move clumsily today. Their left arms often dangle as though they have entirely forgotten them, and they tend to walk in a shuffling sidewise motion, dragging their left legs a little. These problems soon will disappear. The last of the operations in this group was performed only two days ago, on the short wide-shouldered girl whose breasts have already begun to grow. I can see the narrow red line marking the place where the surgeon's beam sliced through her scalp to sever the hemispheres of her brain.

"You have been selected," I say in a resonant formal tone, "for the highest and most sacred office in our society. From this moment until you reach adulthood your lives and energies will



Runild was the wild one, the one they could not control, the one they were afraid they might have to cull from the class before he became lost in madness, a madness the likes of which even the most talented of them could not fathom.

be consecrated to the purpose of attaining the skills and wisdom an oracle must have. I congratulate you on having come so far."

And I envy you.

I do not say that part aloud.

I feel envy and pity both. I have seen the children come and go, come and go. Out of each year's dozen, one or two usually die along the way of natural causes or accidents. At least three go insane under the terrible pressure of the disciplines and have to be culled. So only about half the group is likely to complete the twelve years of training, and most of those will prove to have little value as oracles. The useless ones will be allowed to remain, of course, but their lives will be meaningless. The House of Double Minds has been in existence for more than a century; there are at present just one hundred forty-two oracles in residence, seventy-seven women and sixty-five men, of whom all but about forty are mere drones. A thin harvest out of some twelve hundred novices since the beginning.

These children have never met before. I call upon them to introduce themselves. They give their names in low self-conscious voices, eyes downcast.

A boy named Divvan asks, "Will we wear clothes soon?"

Their nakedness disturbs them. They hold their thighs together and stand at odd storklike angles, keeping apart from one another, trying to conceal their undeveloped loins. They do this because they are strangers. They will forget their shame before long. As the months pass they will become closer than brothers and sisters.

"Robes will be issued this afternoon," I tell him. "But clothing ought not to be important here, and you need have no reason to wish to hide your bodies." Last year when this same point arose—it always does—the mischievous boy Runild suggested that I remove my own robe as a gesture of solidarity. Of course I did, but it was a mistake; the sight of a mature woman's body was more troubling to them than even their own bareness.

Now it is the time for the first exercises, so that they may learn the ways in which the brain operation has altered the responses of their bodies. At random I choose a girl named Hirole and ask her to step forward, while the rest form a circle around her. She is tall and fragile-looking and it must be torment to her to be aware of the eyes of all the

others upon her.

Smiling, I say gently, "Raise your hand, Hirole."

She raises one hand.

"Bend your knee."

As she flexes her knee, there is an interruption. A wiry naked boy scrambles into the room, fast as a spider, wild as a monkey, and bursts into the middle of the circle, shouldering Hirole aside. Runild again! He is a strange and moody and extraordinarily intelligent child, who, now that he is in his second year at the House, has lately been behaving in a reckless, unpredictable way. He runs around the circle, seizing several of the new children briefly, putting his face close to theirs, staring with crazy intensity into their eyes. They are terrified of him. For a moment I am too astonished to move. Then I go to him and seize him.

He struggles ferociously. He spits at me, hisses, claws my arms, makes thick wordless grunting sounds. Gradually I get control of him. In a low voice I say, "What's wrong with you, Runild? You know you aren't supposed to be in here!"

"Let me go."

"Do you want me to report this to Brother Sleet?"

"I just want to see the new ones."

"You're frightening them. You'll be able to meet them in a few days, but you're not allowed to upset them now." I pull him toward the door. He continues to resist and nearly breaks free. Elven-year-old boys are amazingly strong, sometimes. He kicks my thigh savagely: I will have purple bruises tonight. He tries to bite my arm. Somehow I get him out of the room, and in the corridor he suddenly goes slack and begins to tremble, as though he has had a fit that now is over. I am trembling too. Hoarsely I say, "What's happening to you, Runild? Do you want to be culled the way Timas and Jurda were? You can't keep doing things like this! You—"

He looks up at me, wild-eyed, and starts to say something, and stifles it, and turns and bolts. In a moment he is gone, a brown naked streak vanishing down the hallway. I feel a great sadness: Runild was a favorite of mine, and now he is going insane, and they will have to cull him. I should report the incident immediately, but I am unable to bring myself to do it, and, telling myself that my responsibility lies with the new ones, I return to the dorm room.

"Well!" I say briskly, as if nothing unusual has happened. "He's certainly playful today, isn't he! That was Runild. He's a year ahead of you. You'll meet

him and the rest of his group a little later. Now, Hirole—"

The children, preoccupied with their own altered state, quickly grow calm; they seem much less distressed by Runild's intrusion than I am. Shakily I begin again, asking Hirole to raise a hand, to flex a knee, to close an eye. I thank her and call a boy named Mulliam into the center of the circle. I ask him to raise one shoulder above the other, to touch his hand to his cheek, to make a fist. Then I pick a girl named Fyme and instruct her to hop on one foot, to put an arm behind her back, to kick one leg in the air.

I say, "Who can tell me one thing that was true of every response?"

Several of them answer at once, "It was always the right side! The right eye, the right hand, the right leg—"

"Correct." I turn to a small dark-visaged boy named Bloss and ask, "Why is that? Do you think it's just coincidence?"

"Well," he says, "everybody here is right-handed, because left-handers aren't allowed to become oracles, and so everybody tended to use the side that he—"

Bloss falters, seeing heads shaking all around the circle.

Galaine, the girl whose breasts have begun to sprout, says, "It's because of the operation! The right side of our brains doesn't understand words very well, and it's the Right that controls the left side of the body, so when you tell us in words to do something, only our Left understands and moves the muscles it controls. It gets the jump on the Right because the Right can't speak or be spoken to."

"Very good, Galaine. That's it exactly."

I let it sink in. Now that the connections between the two halves of their brains have been cut, the Rights of these children are isolated, unable to draw on the skills of the language center in the Left. They are only now realizing what it means to have half a brain rendered illiterate and inarticulate, to have their Left respond as though it is the entire brain, activating only the muscles it controls most directly.

Fyme says, "Does that mean we won't ever be able to use our left sides again?"

"Not at all. Your Right isn't paralyzed or helpless. It just isn't very good at using words. So your Left is quicker to react when I give a verbal instruction. But if the instruction isn't phrased in words,

the Right will be able to take control and respond."

"How can you give an instruction that isn't in words?" Mulliam asks.

"In many ways," I say. "I could draw a picture, or make a gesture, or use some sort of symbol. I'll show you what I mean by going through the exercises again. Sometimes I'll give the instructions in words, and sometimes by acting them out. When I do that, imitate what you see. Is that clear?"

I wait a moment to allow the sluggish word-skills of their Rights to grasp the scheme.

Then I say, "Raise a hand."

They lift their right arms. When I tell them to bend a knee, they bend their right knees. But when I wordlessly close my left eye, they imitate me and close their left eyes. Their Rights are able to exert muscular control in a normal way when the instructions are delivered non-verbally; but when I use words, the Left alone perceives and acts.

I test the ability of their Lefts to override the normal motor functions of their Rights by instructing them verbally to raise their left shoulders. Their Rights, baffled by my words, take no action, forcing their Lefts to reach beyond a Left's usual sphere of dominance. Slowly, with great difficulty, a few of the children manage to raise their left shoulders. Some can manage only a mere twitch. Fyme, Bloss, and Mulliam, with signs of struggle evident on their faces, are unable to budge their left shoulders at all. I tell the entire group to relax, and the children collapse in relief, sprawling on their cots. There is nothing to worry about, I say. In time they will all regain full motor functions in both halves of their bodies. Unless they are driven insane by the split-brain phenomena, that is, but no need to tell them that.

"One more demonstration for today," I announce. This one will show them in another way how thoroughly the separation of the hemispheres affects the mental processes. I ask Gybold, the smallest of the boys, to seat himself at the testing table at the far end of the room. There is a screen mounted on the table; I tell Gybold to fix his eyes on the center of the screen, and I flash a picture of a banana on the left side of the screen for a fraction of a second.

"What do you see, Gybold?"

"I don't see anything, Sister Mimise," he replies, and the other children gasp. But the "I" that is speaking is merely Gybold's Left, which gets its visual information through his right eye; that eye

did indeed see nothing. Meanwhile Gybold's Right is answering my question in the only way it can: the boy's left hand gropes among several objects lying on the table hidden behind the screen, finds the banana that is there, and triumphantly holds it up. Through sight and touch Gybold's Right has prevailed over its wordlessness.

"Excellent," I say. I take the banana from him and, drawing his left hand behind the screen where he is unable to see it, I put a drinking-glass into it. I ask him to name the object in his hand.

"An apple?" he ventures. I frown, and quickly he says, "An egg? A pencil?"

The children laugh. Mulliam says, "He's just guessing!"

"Yes, he is. But which part of Gybold's brain is making the guesses?"

"His Left," Galaine cries. "But it's the Right that knows it's holding a glass."

They all shush her for giving away the secret. Gybold pulls his hand out from under the screen and stares at the glass, silently forming its name with his lips.

I put Herik, Chith, Simi, and Clane through related experiments. Always the results are the same. If I flash a picture to the right eye or put an object in the right hand, the children respond normally, correctly naming it. But if I transmit information only to the left eye or the left hand, they are unable to use words to describe the objects their Rights see or feel.

It is enough for now. The children are silent and have withdrawn into individual spheres of privacy. I know that they are working things out within their minds, performing small self-devised experiments, testing themselves, trying to learn the full extent of the changes the operation has brought about. They glance from one hand to another, flex fingers, whisper little calculations. They should not be allowed to look inward so much, not at the beginning. I take them to the storeroom to receive their new clothing, the simple gray monastic robes that we wear to set us apart from the ordinary people of the city. Then I turn them free, sending them romping into the broad fields of soft green grass behind the dormitory, to relax and play. They may be oracles in the making; but they are also, after all, ten-year-old children.

It is my afternoon rest period. On my way through the dark cool corridors to my chamber I am stopped by Brother Sleel, one of the senior oracles. He is a white-haired man, tall and of powerful build, and his blue

eyes work almost independently of one another, constantly scanning his surroundings in restless separate searches. Sleel has never been anything but warm and kind to me, and yet I have always been afraid of him, I suppose more out of awe for his office than out of fear for the man himself. Really I feel timid with all the oracles, knowing that their minds work differently from mine and that they see things in me that I may not see myself. Sleel says, "I saw you having difficulties with Runild in the hall this morning. What was happening?"

"He wandered into my orientation meeting. I asked him to leave."

"What was he doing?"

"He said he wanted to see the new children. But of course I couldn't let him bother them."

"And he started to fight with you?"

"He made some trouble. Nothing much."

"He was fighting with you, Mimise."

"He was rather unruly," I admit.

Sleel's left eye stares into mine. I feel a chill. It is the oracle-eye, the all-seeing one. Quietly he says, "I saw you fighting with him."

I look away from him. I study my bare feet. "He wouldn't leave. He was frightening the new ones. When I tried to lead him from the room he jumped at me, yes. But he didn't hurt me and it was all over in a moment. Runild is high-spirited, Brother."

"Runild is a troubled child," Sleel says heavily. "He is disturbed. He is becoming wild, like a beast."

"No, Brother Sleel." How can I face that terrible eye? "He has extraordinary gifts. You know—surely *you* must know—that it takes time for one like him to settle down, to come to terms with—"

"I've had complaints from his counselor, Voree. She says she hardly knows how to handle him."

"It's only a phase. Voree's had responsibility for him only a couple of weeks. As soon as she—"

"I know you want to protect him, Mimise. But don't let your love for the boy cloud your judgment. I think this is Timas happening all over again. It's an old, old pattern here, the brilliant novice who is unable to cope with his changes, who—"

"Are you going to cull him?" I blurt.

Sleel smiles. He takes both my hands in his. I am engulfed by his strength, by his wisdom, by his power. I sense the unfathomable flow of perception from his mystic Right to his calm, analytic Left. He says, "If Runild gets any worse,

I'll have to. But I want to save him. I like the boy. I respect his potential. What do you suggest we do, Mimise?"

"What do I—"

"Tell me. Advise me."

The senior oracle is playing a little game with me, I suppose. Shrugging, I say, "Obviously Runild's trying to gain attention through all these crazy pranks. Let's try to reach him and find out what he really wants, and perhaps there'll be some way we can give it to him. I'll speak to Voree. I'll talk to his sister, Kitrin. And tomorrow I'll talk to Runild. I think he trusts me. We were very close last year, Runild and I."

"I know," Sleel says gently. "Very well; see what you can do."

Still later that afternoon, as I cross the central courtyard, Runild erupts from the second-year house and rushes up to me. His face is flushed, his bare chest is shiny with sweat. He clings to me, pulls me down to this height, looks me in the eye. His eyes have already begun to stray a little; one day they may be like Sleel's.

I think he wants to apologize for his invasion of my group. But all he manages to say is: "I am sorry for you. You wanted so much to be one of us." And he runs off.

To be one of them. Yes. Who does not long to dwell in the House of Double Minds, living apart from the noise and chaos of the world, devoting oneself to oracular contemplation and the service of mankind? My mother's father's sister was of that high company, and in early girlhood I was taken to visit her. How awesome it was to stand in the presence of her all-knowing Right, to feel the flood of warmth and understanding that emanated from her wise eyes. It was my dream to join her here, a dream doubly thwarted, for she died when I was eight, and by then the fact of my left-handedness was irremediably established.

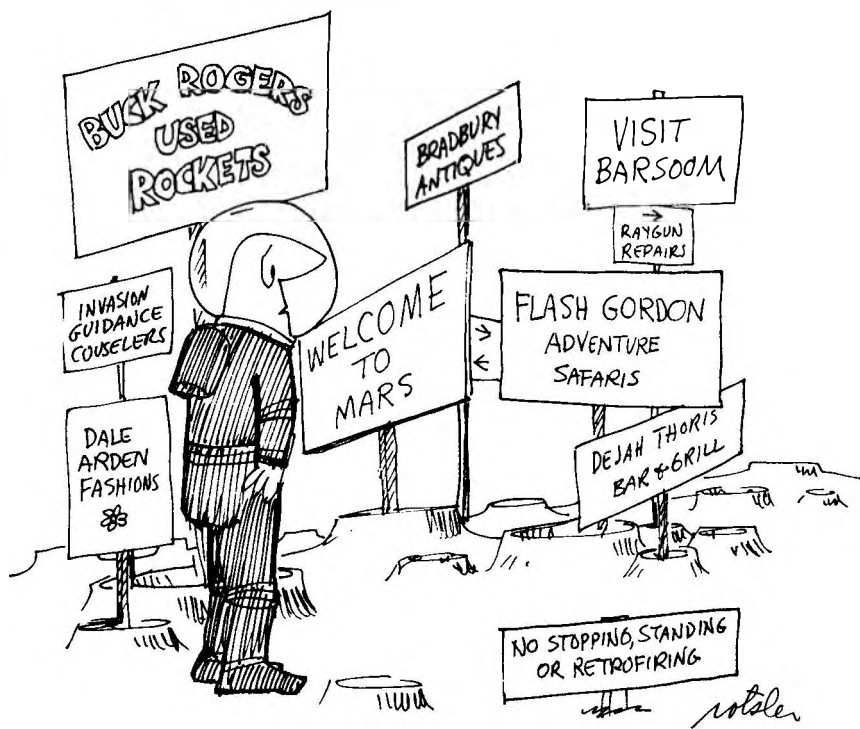
Left-handers are never selected to undergo the oracle-making operation. The two halves of our brains are too symmetrical, too ambidextrous: we have speech centers on both sides, most of us left-handers, and so we are not likely to develop those imbalances of cerebral powers that oracles must have. Right-handers, too, are born with symmetrically functioning brains, each hemisphere developing independently and duplicating the operations of the other. But by the time they are two years old, their Lefts and Rights are linked in a way that gives them a shared pool of skills, and therefore each half is free to develop its own special capabilities, since

the gifts of one half are instantly available to the other.

At the age of ten this specializing process is complete. Language, sequential thought, all the analytic and rational functions, center in the Left. Spatial perception, artistic vision, musical skill, emotional insight, center in the Right. The brain's left side is the scientist, the architect, the general, the mathematician. The brain's right side is the minstrel, the sculptor, the visionary, the dreamer. Normally the two halves operate as one. The Right experiences a flash of poetic intuition, the Left clothes it in words. The Right sees a pattern of fundamental connections, the Left expresses it in a sequence of theorems. The Right conceives the shape of a symphony, the Left sets the notes down on paper. Where there is true harmony between the hemispheres of the brain, works of genius are created.

Too often, though, one side seizes command. Perhaps the Right becomes dominant, and we have a dancer, an athlete, an artist, who has trouble with words, who is inexpressive and inarticulate except through some non-verbal medium. More often, because we are a word-worshipping people, it is the Left that rules, choking the subordinate Right in a welter of verbal analysis and commentary, slowing and hindering the spontaneous intuitive perceptions of the mind. What society gains in orderliness and rationality it loses in vision and grace. We can do nothing about these imbalances—except to take advantage of their existence by accentuating and exploiting them.

And so the children come here, a dozen of our best each year, and our surgeons sever the isthmus of neural tissue that links Left and Right. Some kind of communication between the hemispheres continues to operate, since each half remains aware of what the other is immediately experiencing, if not of its accumulated memories and skills. But the Right is cut free from the tyranny of the word-intoxicated Left. The Left continues to operate its normal routines of reading and writing and conversation and computation, while the Right, now its own master, observes and registers and analyzes in a way that has no need of words. Because its verbal skills are so feeble, the newly independent Right must find some other means of expression if it is to make its perceptions known; and, through the dozen years of training in the House of Double Minds, some of the children succeed in achieving



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America's space program gave us more than a grand adventure. It gave us good, practical everyday benefits.





The man-in-space program in the U.S. is all but over, but the benefits we will accrue from that massive effort are just beginning to become obvious.

SPINOFF

article/Igor Bohassian

Over the past fifteen years the people of the United States, or at least a large percentage of them, have been both emotionally and intellectually involved with our space program. It was a program which was started, basically, to settle an argument between the Navy, Air Force and Army over who should control our rocketry and space research.

The problem was solved by giving control of rocket defenses to the Army, tactical rocketry to the Navy, strategic rocketry to the Air Force, and space (or at least man-in-space) to the National Aeronautics and Space Administration. Of course, it is doubtful if President Eisenhower or his advisors thought it was possible that we would one day be involved in putting men on the moon. Or if they did think it was possible, they probably thought it to be at least fifty years away.

On October 4, 1957, Sputnik woke Americans up to the fact that there were other technically advanced nations on this Earth, and on May 24, 1961, John F. Kennedy put America on the road to the moon.

But President Kennedy's commitment to put an American on the moon, and the people's applause at that decision, was almost totally emotional. That emotion, that spirit of direction and high adventure, did put an American on the moon, to be followed by others, but now that emotion has worn off, and people

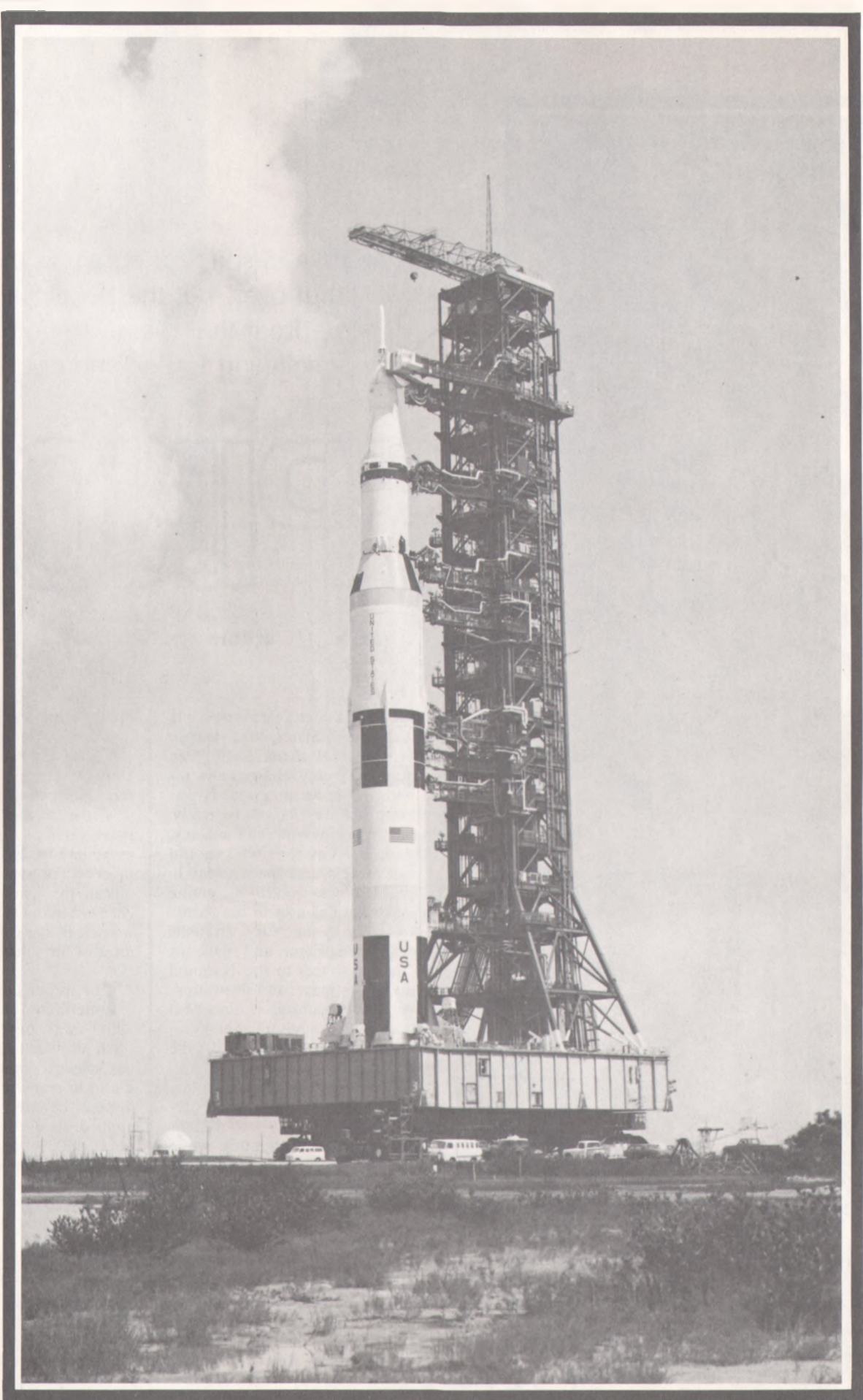
are asking, in greater and greater numbers, "Was it worth it?"

Yes, it was worth it. And *not* just in emotional terms. Not just as an adventure. Not just to say that an American was first. It was worth it in what the space program has given to each and every one of us, in practical advances, in everyday application. For the spin-offs of the space program has quietly changed the lives of every man and woman in the country, and, indeed, of most of the inhabitants of our planet.

The prodigious research, development and manufacturing effort which was put together under the catch-all heading of the space program has spawned many tools and products useful to mankind and placed at man's disposal new technology which will be applied all over the world to produce novel and better products for society. Advances in computers, miniaturization, electronics, exotic materials and many other byproducts have become part of our way of life almost without recognition.

A large part of this is because the program was so big, people expect the advances to be equally big and attention getting. Some of them are. An example is the use of satellite observation of pollution problems, which has already led to both better control of pollution and crackdowns on those who continue to

The technology which sent man and his massive rockets into space has already begun to make major changes in Earth's own forms of living, with many more changes to come in the future.



pollute after they have been told to stop.

Less spectacular are items such as ballpoint pens which will write in any position, developed to write in the weightless environment of space; heat transfer systems designed to keep spacecraft temperatures livable, but which have been adapted for cooking meats from the inside out, or, conversely, freezing from the inside out for better storage; digital clocks which make use of a precision direction-control device to change the numbers on the clock, originally designed by NASA for controlling wind-tunnel models of spacecrafts. Less spectacular than pollution control, but still fall-out from the space program. Direct returns on our dollar investments.

Probably one of the most obvious areas improved as a direct result of space research is communications. The Earth-orbit communications satellite has, within a decade, progressed from a novelty to an operational tool which has had profound effects on our society. Everyone who watches television knows that he sees and hears events occurring across continents and oceans because of satellite relay. One communications satellite transfers 9,000 telephone calls, 12 color television channels, or any combination of these, between the nations of the Earth, bringing them closer together than ever before. Even the famed hotline, the teletype circuit between Washington and Moscow, is being rerouted through a satellite for greater reliability. Relaying through a satellite costs approximately \$4,000 per year per channel, as opposed to the \$25,000 per year per channel cost of a submarine cable.

Seventy-six nations own the International Telecommunications Satellite Consortium (Intelsat), which is made up of 42 ground stations in 29 countries, and which leases 2,000 full-time circuits and relays 1,000 hours of television around the world every year. The satellites which switch those programs and phone circuits around the world are launched by NASA, and both the relays and the boosters which put them in orbit are a direct outgrowth of our space program.

The most significant advances in weather reporting of this century, perhaps even since the invention of the barometer, were achieved through progressive development of meteorological satellites to a fully operational system which supplies data to the National Weather Service.

Global weather reporting through in-

ternational participation has been expanding for seventy-five years, but, until the invention of the weather satellite the weather information has come from less than twenty percent of the earth's surface. The other eighty percent, primarily the oceans where most of the storms and disturbances breed, was covered only by scattered and intermittent reports from ships.

In the early 1960's the weather satellite made possible observation of the entire surface of Earth. What the satellite saw and measured was immediately transmitted to ground stations, permitting fast expert interpretation of the data. Today's orbiting spacecraft, equipped with cloud cover cameras and infra-red cameras and temperature measuring instruments enable man to observe the atmosphere continuously and to track severe storms. Four satellites, properly spaced above and around Earth, can monitor nearly all of Earth's cloud cover all the time.

Fifty nations use the information provided by the network of U.S. weather satellites, launched by NASA for the National and Oceanographic Administration. During the next decade it is expected that advanced satellites and computers will provide reliable long-range weather predictions of two weeks or longer. Eventually the weather satellite can be one of several devices which, combined, will make possible weather control and modification. Land, sea, air and space transportation will proceed with enhanced safety and efficiency because of timely and reliable weather data, gathered as a direct result of our space program.

The navigation of ships and aircraft requires the determination of exact position, the direction and rate of movement from one point to another, and the ability to communicate that information. Navigation via satellite fills this need perfectly.

Satellite navigation systems can provide global coverage and are practically invulnerable to weather, available day or night, and provide instantaneous response. Earth orbiting satellites discern ship and aircraft positions much more accurately than earlier systems. Such a capability is vital for traffic control in today's fast moving environment for air traffic. With satellite assist, ground controllers can pinpoint a jet liner's position within less than one mile.

In agriculture, photography from aircraft ushered in a new era of crop and forest observation, but the capabilities were limited, quite limited when

compared with photo coverage from a satellite. The satellite permits regular, periodic observation in routine operation which can make use of multi-spectral scanners, infrared film, television and conventional photographic techniques.

With the aid of satellites man can better manage crop and timber resources. He can monitor the state of their health, determine the best time to plant and harvest for maximum yield, detect potential damage to crops from blight or infestation, help improve land use, inventory crops during growth and have advance warning of drought, erosion and floods.

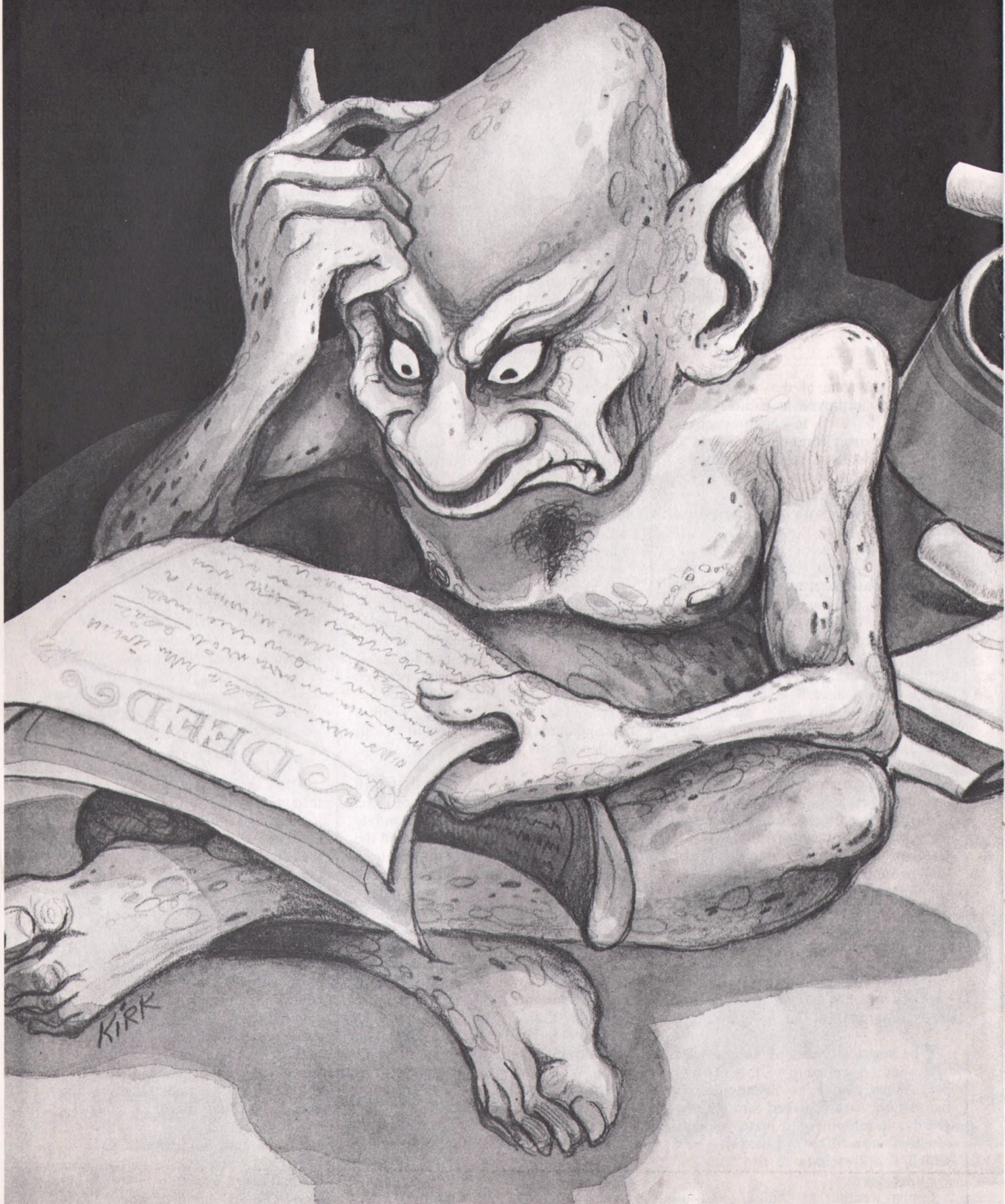
NASA is moving ahead in the development of Earth resources sensing systems in cooperation with the U.S. Department of Agriculture, the U.S. Geological Survey and many state governments. The possible future applications of agricultural satellite observation cover a wide field:

- Range surveys
- Crop disease
- Insect detection
- Fire detection
- Land use changes
- Crop identification
- Natural vegetation
- Flood control survey
- Wildlife habitat
- Watershed and hydrologic studies
- Forest species identification
- Recreation site evaluation
- Irrigation development

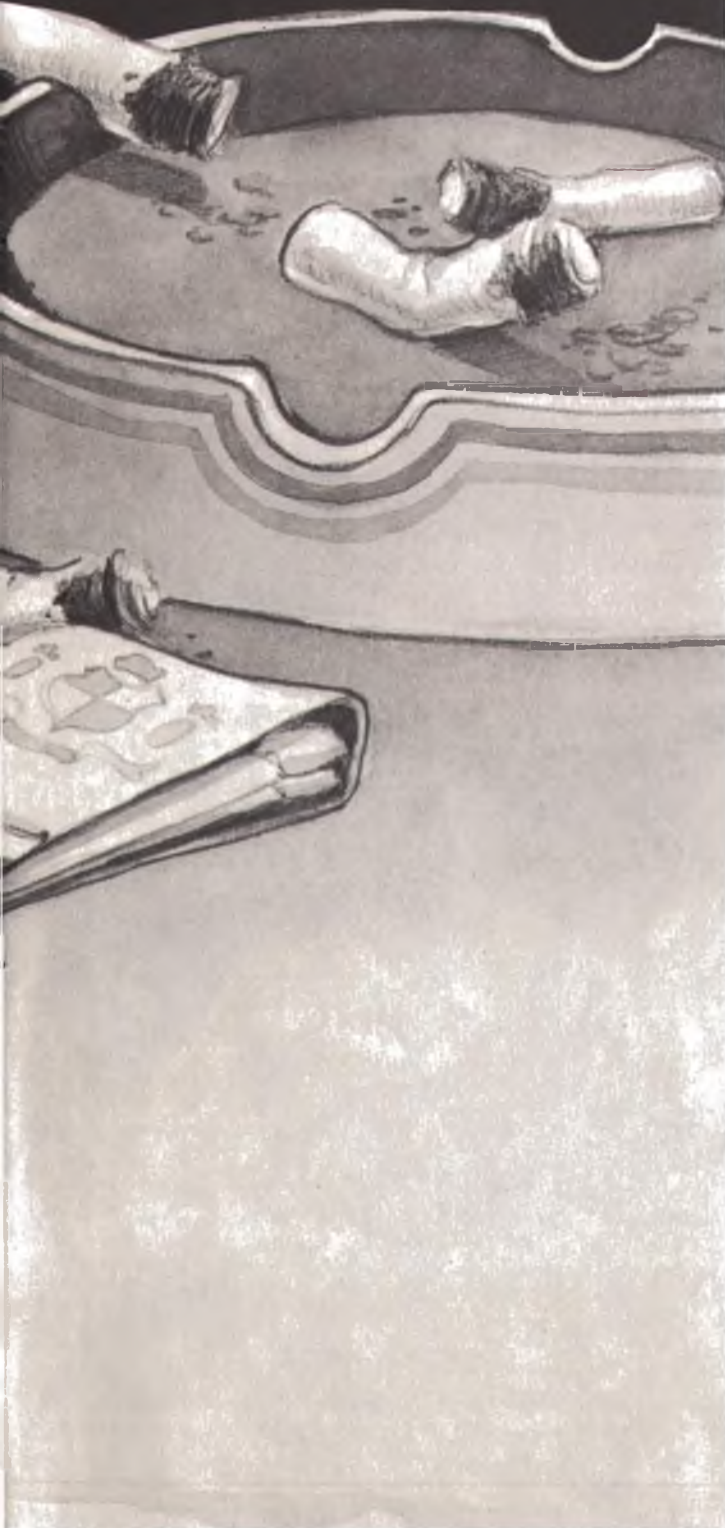
And many more possible uses, the surface of satellite agricultural studies only just being scratched.

The Earth's obscuring envelope of air has limited the effectiveness of astronomical observations since man first looked up at the stars. By transferring observation equipment to space, outside that envelope of air, man has acquired the capability to investigate the universe in much greater detail. Astronomers have discovered additional X-ray emissions from various regions of space, detected ultraviolet and soft X-ray energy coming from the sun, and discerned radio waves emanating from Earth that resemble waves which appear to be coming from Jupiter. Planned future space projects will further assist astronomy by carrying instruments of larger size and enhanced capabilities. From this will come a better understanding of our universe, and therefore of our Earth.

A new and comprehensive view of Earth's resources is offered man for the first time. A view from space. Every
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Occurance In A Cincinnati Bog



In the great fabric of space/time, mistakes, mix-ups, occasionally occur. The trouble is, there are times when the person most effected by the mistake just doesn't care.

Now where did I put that goddamned electricity bill?" George Berger grumbled to himself, pawing frantically through the immense pile of papers on his desk. "Probably threw it away."

Muttering, he picked up the small metal wastebasket next to the desk, turned it upside down, and slammed his fist against the bottom.

A tiny, nude, fat, green man with a pointed head, pointed ears, and orange eyes tumbled out. He landed on his head and rolled over on his bulbous belly three times. "Holy Moses," he said in a gruff voice. "What a rush!"

George peered into the wastebasket, then turned to his tiny visitor. "Say, did you happen to see an electricity bill while you were in there?"

The green man got clumsily to his feet and looked around the room. "Hey, what is this?" he said. He blinked his bright eyes twice, then removed a tiny scrap of paper from his navel. He unfolded the paper seven, eight, nine times, until it had become regular legal size, then squinted at it.

"Is this 650 Birchwood Street?" he asked.

"Yeah," George said, opening drawers and peering inside them.

"Then what the hell are you doing in my territory?" the green man demanded, pointing a stubby finger at George.

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Clap two hands, Hiroshi thought, and there is sound. He clapped once, precisely, with two hands. There was sound.

But what is the sound of one hand clapping? He made the motion with one open hand. There was no sound.

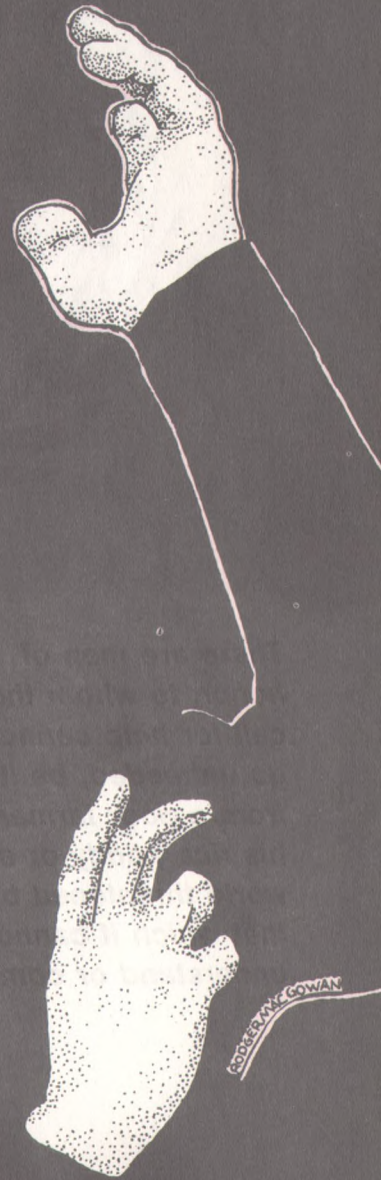
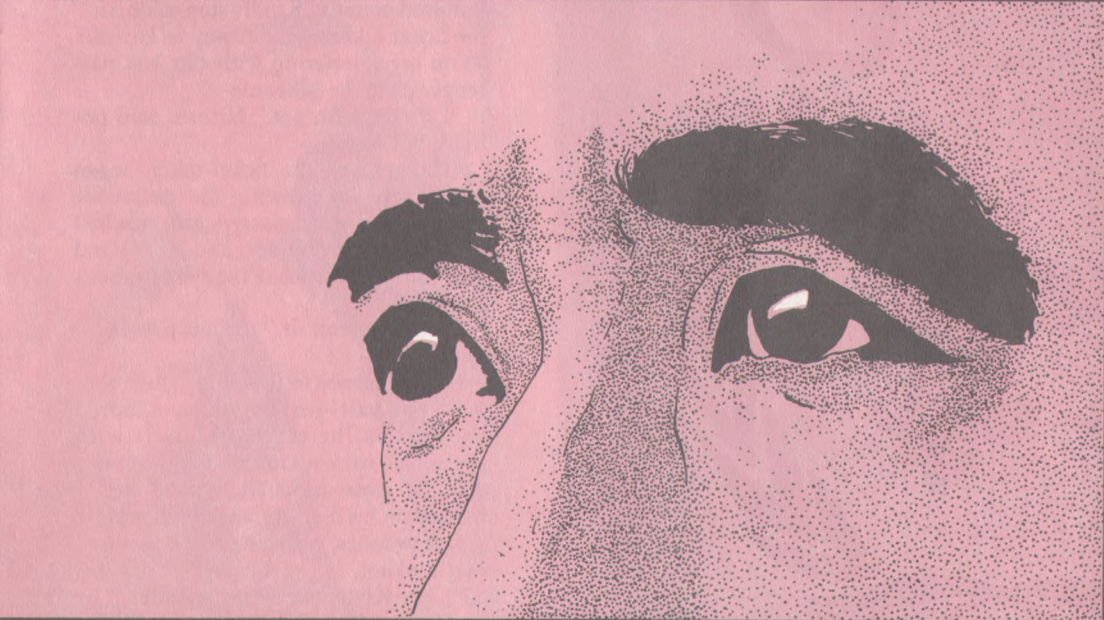
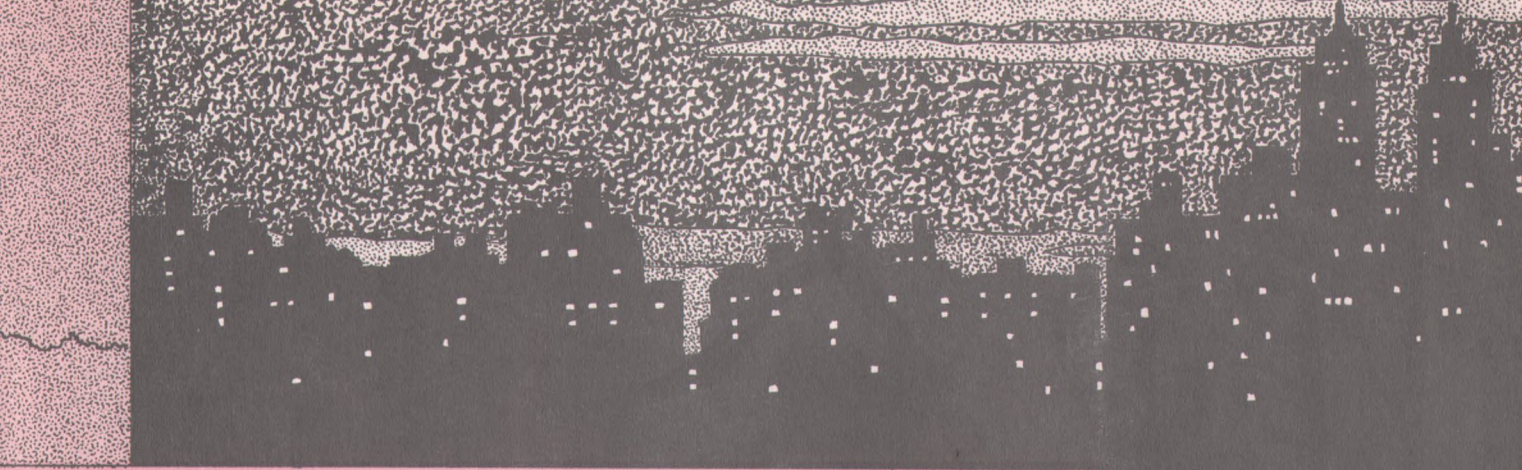
But one hand with ki extended . . .

Was there a ghostly sound?

Hiroshi listened carefully. No, that was not the clap of one hand he heard. It was more distant, more urgent. It was the call of imperative need.

O-Sensei, I go, he said in his mind. He stood, stepping into his wooden sandals at the edge of the *tatami*. He let the pleats of his black *hakama* skirt straighten, and walked serenely out of his *dojo*. His students did not even turn from their exercises, for the ways of their honored teacher were at times inscrutable.





Power can mend or kill,
bless or threaten the
user and he whom it is
used upon.

KJ

fiction / Piers Anthony and
Roberto Fuentes
artist / Rodger MacGowan



There are men of honor, to whom the call for help cannot go unheeded, be it from a poor farmer in his rice paddy or a world threatened by that which it cannot understand or combat.

He walked down the narrow street, his sandals making no sound on the cobblestones. The houses were wooden, two and three stories high, gay and clean and individual. Some resembled pagodas, and here and there were small, pretty gardens with dwarf trees and oddly shaped shrubbery. The way was crowded now; the majority of the men and women hurrying by wore kimonos, but perhaps two in five were in the ugly new Western dress. Street vendors hawked their wares with piercing cries, selling fish, shrimp and octopus.

He arrived at the Tokyo airport ten minutes before the great jet was scheduled to take off. Most of the passengers had already boarded. A phenomenally fat man was just emerging from a rest room.

Hiroshi walked down the passage to the door to the airfield. "Ticket, sir?" the guardian of the gate inquired.

Hiroshi shrugged. "I travel to New York City, in America."

"I know where New York is!" the man said testily. "But you have to have a ticket! And you'll have to take another flight; this one is sold out."

Hiroshi shook his head gently, touching his wispy beard. "This flight is necessary."

"Not without a ticket!"

The huge man came up behind Hiroshi. The man was not actually tall, but he dwarfed the little teacher, who stood just five feet high and weighed one hundred pounds. "Kindly step aside, sir," the ticket-taker said abruptly to Hiroshi. "You are interfering with our last passenger, and the schedule—"

"I regret I can not," Hiroshi said politely but firmly.

"Old man—" the ticket-taker began ominously, not showing the deference due to age. Then a massive arm reached over Hiroshi's shoulder, and a fat hand oily with sweat balked the ticket-taker's action.

"One moment, sir," the last passenger said.

Hiroshi turned to face him. The man's bulk was vast—perhaps three hundred pounds—but he carried himself with power. He wore a kimono to accommodate his gross musculature, and sturdy sandals on his feet. He was in his middle or late twenties, with long black hair tied in a topknot.

"I am Kiyokuni, sumo wrestler," he said.

"Hiroshi, aikido."

They bowed to each other formally, the large and the small. "I *thought* I recognized you, *O-sensei*, but I did not expect to find you in such a place as this!" Kiyokuni said. "I have long wished to meet a teacher of your eminence."

"On the contrary," Hiroshi demurred. "It is an honor to address an esteemed young member of the Yokozuna, the very highest league of wrestling. I have admired your career."

"Sir, you must board!" the ticket-taker said urgently to the wrestler. "See, the fuel line has already been taken from the wings of the plane—"

They ignored him. "No career compares with yours, greatest of teachers," Kiyokuni said, deeply flattered. "I am bound for Hawaii, to give a sumo exhibition. But I would cancel it instantly to visit with you."

"I regret I must travel to New York," Hiroshi said. "But another time—"

There was the growing sound of the jet motors warming up. "Sir!" the ticket-taker cried desperately. "The flight will leave without you!"

"This airplane continues to America,"

Kiyokuni said. "My ticket is only to Hawaii, but if you would accept it—"

"This is most kind of you," Hiroshi said, accepting it.

"But your exhibition!" the ticket-taker cried over the roar of the engines.

"Let it wait! I will take the next flight!"

Hiroshi presented the ticket-taker with the ticket and went out to board the plane, cutting off further discussion. He found his seat and was strapped in just as the machine began to taxi down the strip.

They were airborne. He peered out of the window, intrigued by the view of the city. The plane circled, gaining altitude, then oriented east and moved out over the ocean.

"This—this is a skyjack!" a nervous voice said.

Hiroshi looked down the aisle. It was a Korean University student, a short chubby swarthy peasant-type in a Mao jacket, holding a Nambu automatic pistol. The gun shook, but it was no less dangerous because of that!

"Tell the pilot to take it to North Korea!" the hijacker said in bad Japanese. The side of his face twitched.

The stewardess, pale but composed, turned. "Wait!" the man cried. He looked about wildly, and his gaze fell on tiny Hiroshi. "You, old man! You're my hostage! If they don't turn the plane, I'll—I'll shoot—*stand up here!*"

Gravely Hiroshi stood up and sidled past the man on the adjacent seat, a horrified Caucasian tourist. Hiroshi was the least impressive figure of a man on the plane, physically—yet there was an aura of serenity about him that gave him stature. The gunman should have noticed.

"You all see?" the hijacker cried, as though playing to an audience. "I'll shoot—I'll kill this feeble old man! So you just tell the pilot—and don't use the radio! North Korea!"

The stewardess walked slowly toward the pilot's compartment. The gunman gestured violently to Hiroshi. "Right here in front of me! Closer!"

Hiroshi came to stand facing him, looking very small and frail. He extended his *ki*, but the student's deathwish was so strong that no control was feasible at the moment. "It would be better not to do this," he said gently.

"Shut *up!*" The gun jabbed at Hiroshi's chest.

"Innocent people could be hurt," Hiroshi said as though establishing a point of order. "And I regret that I am unable to visit Korea at this time."

"I'll shoot!" the man cried, jabbing again.

So swiftly that no one saw his hand move, Hiroshi placed the fingers of his left hand on top of the pistol, pushing the barrel back. It was a slide-action weapon, and could not be fired in this position. Almost simultaneously his right hand shot forward, fingers stiffly extended. They struck the man's solar plexus with a force few would have believed.

The watching passengers gasped as the hijacker crumpled, unconscious. The pistol was now miraculously in Hiroshi's hand. "I regret the necessity," he said to the others. "Please take this weapon to the pilot for safekeeping, and ask him to resume his scheduled route. We shall have to make this unfortunate youth comfortable."

Someone took the gun, gingerly. Hiroshi squatted to attend to the injured man. He placed his hand on the hijacker's chest and extended his *ki*. "The pain of dying is more than this," he murmured.

The eyes opened. "Then I don't want to die!"

Hiroshi nodded wisely. "You will remain in Hawaii. I have need of your ticket."

The youth fumbled in his pocket and brought out his ticket. It was to New York. "I—I never really wanted to go to Korea! It was *life* I hated, and I thought I would get killed . . . but now even jail seems sweet! Something inside me—" He touched his chest where Hiroshi's hand had rested. "Some strange power—you made me well!"

"I merely showed the way," Hiroshi said. He returned to his seat as the ex-hijacker got up. There was a kind of glow on the face of each, reflected in the faces of the passengers.

The co-pilot came down the aisle. "Who broke up the hijack?" he demanded. "There'll be a reward—"

People gestured to Hiroshi. "Please see that he is not punished unduly," Hiroshi said. "He needs medical attention, and is sorry for the misunderstanding."

The co-pilot looked down at him. "So you're the one!" he said, not concealing his surprise. "Well, I can't promise, but I'll try. What's your name?"

Hiroshi handed him his original ticket. "Kiyokuni," the pilot read from the envelope, making a note. "This name will make headlines all over the world, tomorrow!"

But Hiroshi was already entering meditation. *I am hanging by my teeth over an abyss*, he thought, *looking down*

into the level water far below. He looked, and saw the ocean. "*What is Zen? a seeker inquires. What shall I answer?*"

But long before he had the answer the smoggy spires of New York, America, appeared. He put aside the problem with infinite patience and stepped down to wintry Kennedy Airport.

"Your passport, sir," an official said in English.

"It is very kind of you to inquire," Hiroshi replied in the same language, and walked on.

The official chased after him, blocking his way. "I must check your passport!"

"I much appreciate the offer," Hiroshi replied with consummate courtesy. "But I shall not put you to this trouble. I possess no passport."

The man's mouth turned dour. "Then you'll go right back where you came from, old-timer!"

Perceiving the man's distress, Hiroshi put a gentle hand on his white wrist. He extended his *ki*. The officer's belligerent countenance smoothed. Now he was at peace.

Hiroshi took Route 78 west, walked across the Brooklyn Bridge, and went north on Broadway. He admired the glittering signs and imperative traffic. *How like Japan!*

People stared at him, for it was a bitterly cold October afternoon, with a cutting wind swooping down the street, and he wore only his light shirt, dark skirt, and open wooden sandals. But the *ki* was about him, making him impervious.

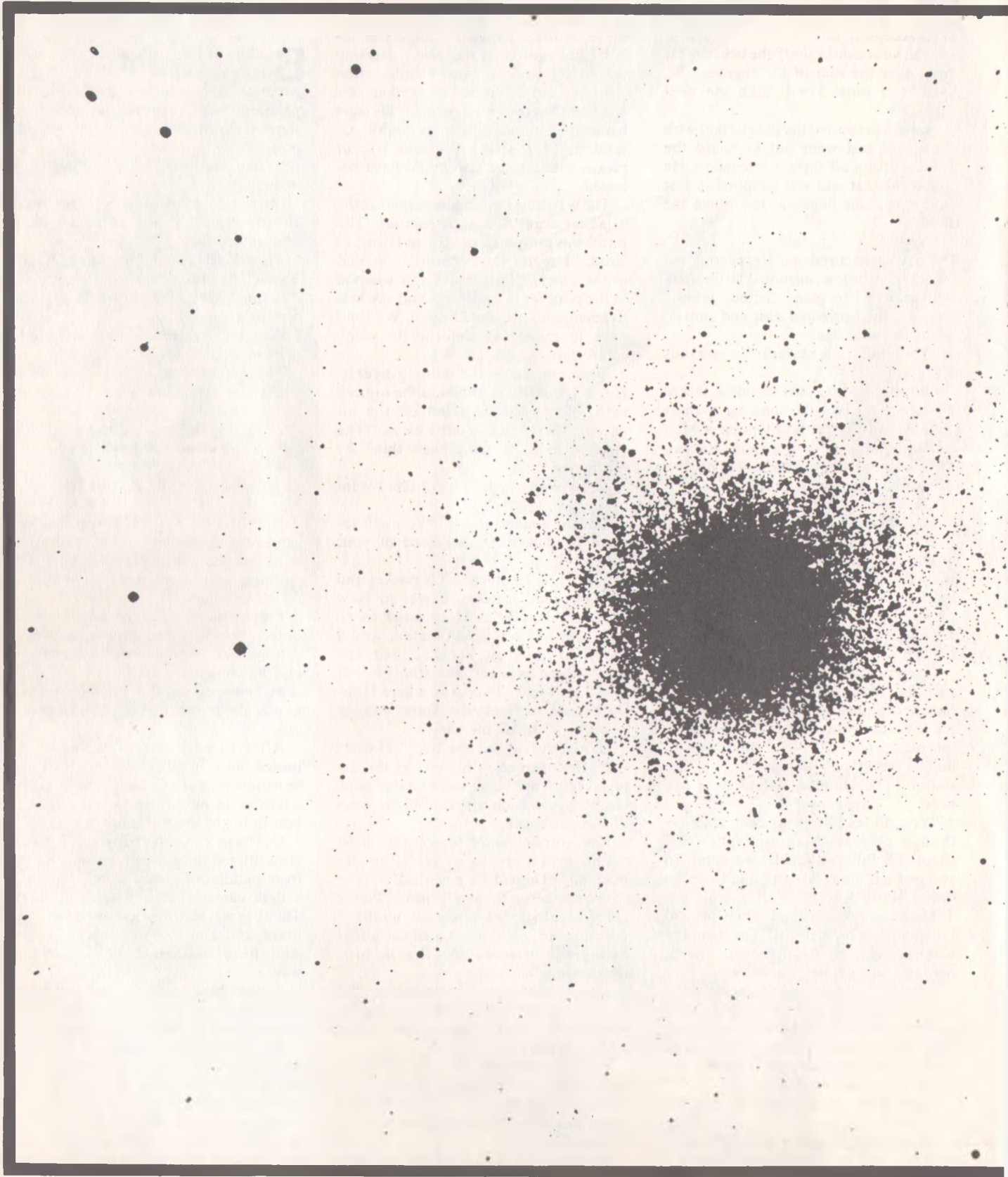
After three hours of walking, he turned into an alley. In America, he remembered, men did not relieve themselves on the public streets. It was always best to honor the foibles of the natives.

Garbage cans overflowed, broken glass littered the path, and a stench rose from puddles of greasy water. This was a dark canyon between tall buildings. The alley was restful after the continuous glare and flash of the main street. And—his *ki* awareness guided him this way.

A large black man jumped out from the shadow of a doorway. His hands closed about Hiroshi's thin neck.

The little teacher calmly reached up and grasped the mugger's two thumbs, one in each hand. Very gently he turned his hands outward, carrying the thumbs along and breaking the choke. The mugger swore fiercely and fought, but the pressure was inexorable. In a moment the two thumbs broke.

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GHOST UNIVERSE

article / James Sutherland

**From neutrinos to tachyons,
there's more to the atom than
meets the mind of the
classical theoretician.**

A cold night wind bowing the trees, an inexplicable noise in the attic, the hidden backside of the moon: people have always been equally fascinated and scared by things they can't see. Human history is rife with these phantoms. A very old Scottish prayer seeks deliverance from all the shadowy "ghoulies and ghosties and long-leggedy beasties, and things that go bump in the night. . . ."

In an early novel, H. G. Wells cannily updated this mixture of curiosity and fear, placed it in the milieu of industrial England and produced an even more powerful concept—an invisible man. The idea of an interloper in our midst, seeing everything while going completely unnoticed himself, is an exceptionally evocative piece of fantasy, but still no more than that. Despite the elaborate rationale Wells worked out for inducing invisibility (drug-treatments) in his character, the whole notion of a transparent human

being is one with the ghoulies and the long-legged beasts in terms of plausibility; some eighty years of scientific research has rendered the concept of invisibility quite untenable. Ironically, the other things that went bump in the dark have been reclassified as "parapsychological phenomena," and gained considerable respect, and now are being investigated by hundreds of university graduate students in this country.

Nevertheless, the ancient curiosity about *things* that people cannot see continues unabated, having split into a pair of divergent lines of inquiry.

The first, and probably the most spectacular, led to the new science of radio astronomy, and, in recent years, the discovery of neutron stars. These aggregations of collapsed matter are so minute in the scale of the universe, they can be detected only with powerful radio receivers tuned to the emission frequency of these objects. Following the disclosure of neutron stars, radio astronomers speculated that even denser invisible stars might exist: the so-called *black holes*, that had gravities so high that they pulled space entirely around them and dropped out of the Universe completely.

The second line of research tended to move in exactly the opposite direction, down a subtle pathway to the tiny and sometimes-paradoxical world that is locked in the center of the atom.

Initially, the atomic nucleus seems like an unpromising starting-point for earnest ghost-hunting. Four generations of high school science instructors have given most people the impression that atoms are actually fairly mundane items: like miniature solar systems composed of electrons, protons and neutrons. It's a neat, tidy concept; and it is something of a shame that that orderly image bears absolutely no relation to reality.

The solar-system-model of the atom is a relic, a hangover from pre-World War II physics that seemingly refuses to die a natural death. It was conceived by an English physicist, Ernest Rutherford, in 1908 to account for a discovery he had made: that the atom is not the smallest particle of matter, but rather is made up of an outer shell and a central core. Rutherford found that the volume of an atom was something on the order of one hundred thousand times the volume of the nucleus. Obviously, there was a lot of empty space inside the atom, and the analogy with the solar system must have occurred to him immediately. The Danish physicist Neils Henrik Bohr atomic model, and remained its chief proponent for some twenty years.

Bohr and Rutherford's concept was admirably simple and dramatic: a nucleus "sun" comprised of positively-charged protons and chargeless neutrons, around which negatively-charged electrons orbited like planets. The proton, neutron and electron were supposed to be the ultimate bits of matter, the three elementary particles.

By the early 1930s the elegant, symmetrical world of the Bohr-Rutherford model had developed several serious drawbacks. It could not explain the erratic behavior of the electrons, which seemed to leap from one orbit to another, then back once more, without actually crossing the space between the orbits. It did not indicate how those electrons could have, simultaneously, the properties of a speck of matter *and* a wave of energy, apparently whenever the electron wanted to. And it was inadequate to describe the odd behavior of the neutron when that particle disintegrated.

Why did it take so long for the weaknesses in the model of Bohr and Rutherford to show up? There were several reasons, but primarily, it was due to the liberation of thought and imagination by Einstein's theory of relativity which was just then becoming widely accepted. Also, the 1930s marked the introduction of far more precise and sophisticated devices to measure the results of atomic experiments. Miniscule data that had slipped by earlier primitive equipment was detected by the sensitive new recording and counting gear, the likes of which Bohr and Rutherford had never seen in their days.

However, it was still something of a shock when, in 1931, the Austrian physicist Wolfgang Pauli proposed the existence of a *fourth* elementary particle.

It came about in this manner. Pauli, like many physicists of the period was profoundly disturbed by the peculiar actions involved in the breakdown of neutrons in the atomic nucleus—circumstances observed by dozens of researchers over a span of several years. What bothered them was not so much the fact that the neutron did break down (by this time, they had resigned themselves to the knowledge that their "elementary" particles weren't so ultimate and inviolate after all), but that the Law of Conservation of Energy was being violated.

According to the Law, energy can't be destroyed, only relocated.

Yet, a neutron breaking down produced a proton and an electron: when added, their respective energy quotas came out to something less than that of

the original neutron. And there was more trouble, too, for the Law of Conservation of Mass dictated that the sum of the masses of the products of such a breakdown should equal the mass of the neutron. Combining the masses of the proton and electron yielded a loss of mass equivalent to a bit less than half that of an electron—for all intents and purposes, that trace of energy and mass had simply vanished into nothingness.

Now this was an unacceptable premise. The two Laws were considered to be the major working principles of the Universe, and if they did not hold in this case, they were not true laws at all, but another convenience like the "ether," which Michelson and Morley disproved in 1887.

Pauli resolved this dilemma with an adventurous suggestion. Suppose, he theorized, there is another particle, smaller than an electron that carries the requisite amount of energy with it, but is undetectable by our instruments? Such an entity would account for the discrepancies in mass and energy taking place during neutron breakdown, and hence redeem the two Laws.

Most physicists accepted Pauli's theoretical particle for that reason, though they probably felt uneasy about admitting a certified ghost into the pantheon of particle physics just to maintain the Laws. Soon, though, the particle—named the *neutrino* by Enrico Fermi—came in handy to explain certain other atomic reactions that had previously baffled scientists. Neutrinos were the key to understanding why certain stars suddenly run wild and turn into supernovae, shining briefly with the brilliance of an entire galaxy; previous to the neutrino there was no way to fully account for the incredibly rapid energy changes that occur within these special stars.

Over the years, physicists built up a plausible picture of the neutrino as more and more data about it accumulated. It is, as Pauli predicted, a particle very much smaller than an electron (which was previously believed to be the most minute division of matter possible), but unlike the electron, the neutrino at rest has no physical characteristics other than a somewhat mysterious quality called "spin," which in simple terms means that it behaves as if it were turning on its axis like a tiny gyroscope. Otherwise, the neutrino is a pure ghost, lacking an electrical charge, a magnetic field, or any mass at all!

An entity without mass sounds like a contradiction. Without mass, how can the neutrino be said to exist?

The catch is in the phrase *at rest*. If

a neutrino came to a complete stop its mass would be zero. However the neutrino, obviously, never rests; instead, from the moment of its birth during the breakdown of a neutron, the young neutrino is moving at the speed of light. And according to the theory of relativity, as anything approaches the speed of light it acquires mass in proportion to its velocity.

Even though it has some degree of mass, a neutrino is still a ghost in the Universe because it is traveling at the highest possible speed known. Chargeless, non-magnetic, and traveling at 186,000 miles per second, the neutrino treats matter as though it doesn't exist. It will plunge, unaffected, through the Earth in less than a ten-thousandth of a second, or zip blithely into and out of the roiling heart of the sun in only a fraction longer. It makes no difference. To the neutrino, you and me and the remainder of the Universe does not exist.

This is due largely to the fact that atoms contain so much altogether empty space through which the neutrino can pass in its accustomed style. But there is always the chance that a flying neutrino will run smack into another electron, proton, or neutron—or even another neutrino. The odds in favor of such a collision are slight, about one in ten billion, even using a fairly dense object like our Earth as a target.

The odds quoted are depressing indeed until one considers that the number of neutrinos shooting past any particular point also number in the billions. Sooner or later, according to the inexorable rules of statistics, there is bound to be a hit.

Following this sequence of logic produced the very first documented proof that neutrinos exist, that they are more than a felicitous way to preserve some Laws of nature.

In 1956, a pair of American physicists, Clyde Cowan, Jr. and Fredrick Reins, announced they had discovered the neutrino in extensive laboratory tests extending over three years by employing the statistical method outlined above. Reins and Cowan found a particularly rich source (in theory) of neutrinos in a nuclear reactor in South Carolina. Atomic fission supposedly would liberate vast quantities of neutrinos by its very mode of operation, which is breaking down atomic nuclei to release energy. The two physicists devised a "neutrino trap" near the reactor: long tanks of water surrounded by hundreds of phototubes.

In several tanks, the water was laced with a special chemical compound that emitted a tiny burst of visible light

whenever one of its molecules was struck by an elementary particle. Meanwhile, the phototubes counted each separate scintillation in the tanks. Cowan and Reins were careful to subtract a certain number from the total the phototubes recorded every day; this number represented a statistical estimate of the amount of neutrinos coming in from outside sources other than the reactor. The final figure represented, they hoped, the real number of neutrinos expelled from the reactor.

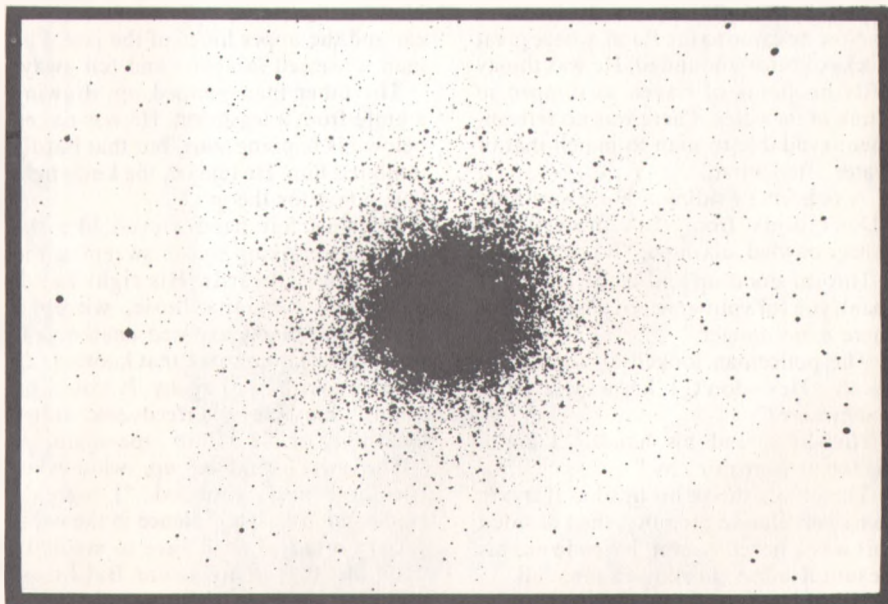
After more than thirty months, the two physicists matched their totals against the number statistics said *should* have occurred during that period. Both sets matched closely. There was no room for doubt: the neutrino existed. Cowan and Reins had caught their ghost particle.

Later, other physicists and astronomers used a variant of the Reins-Cowan experiment to produce "neutrino telescopes," to measure the number of neutrinos streaming out of the sun, thus providing a valuable clue to the processes taking place in the solar core. In order to shield these odd "telescopes" (actually vats of chlorine compounds in fluid form) from stray radiation of other sorts, these devices are placed at the bottom of mile-deep mines in the U.S. and South Africa. At these depths, only the neutrino can penetrate down to the 'scopes, and there be detected, counted and analyzed.

In the quarter-century between the proposal and the real discovery of the neutrino, the trail of research occasionally led into some far-flung and definitely peculiar areas. One of the strangest of these territories was found to be filled with a different kind of ghost-particles that are mirror-images of the common constituents of our Universe.

The very first elementary particle to be revealed in laboratory experiments was the electron, identified by the English physicist Joseph John Thomson. Thomson, who casually unloaded this bombshell during an evening lecture at the famous Royal Institution on April 30, 1897, determined that the electron was a minute bit of matter, entirely separate from an atom, and bearing a negative charge. Thirty years later, another Englishman, physicist Paul Dirac, suggested that the electron might have a twin brother—possessing identical physical characteristics, save one. According to Dirac's calculation, this particle would be charged positively. It would be an anti-electron.

Dirac had not so long to wait as did Pauli for his theory to be vindicated. An American studying cosmic ray behavior found evidence of Dirac's particle and named it *positron*, a shortened version of positive-electron. The physicist, Carl Anderson, made his announcement in 1932, barely two years from the publica-
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**Elementary particles are
growing in the garden of
physics like superfast weeds!**

The man screamed, but Hiroshi extended his *ki* again and made the hands go numb. "Violence is unfortunate," he murmured regretfully. "It is an insufficient response to the prior wrongs done you and your people. Go to the police; they will treat your injury and confine you until your drug addiction is gone. Do not accept the first probationary position you are offered, or the second, for they will lead you into inadvertent temptations. The third will seem intolerable, a thing of no pride, but that is the one you must take. In three years we shall meet again, in better circumstances."

He walked on down the alley, the mugger staring after him. Hiroshi's students sometimes came to him by devious routes, but he had not before recruited in a New York alley!

At dusk an hour later he reached the southern fringe of Central Park. He entered it through the "Artist's Gate," passing under the gaze of Simon Bolivar, to whom he made a little bow of greeting.

Inside he turned right, admiring the trimmed hedges near the path like any other tourist. Despite the cold, there were some blue and pink flowers. The lights were coming on in the buildings adjacent to the park, giving the effect of a Chinese Wall of immense proportion surrounding this lush valley, with illuminated mountains beyond. There was not a prettier spot this instant in all Japan, he thought appreciatively.

Now he came to the Pond, where great flocks of birds abounded. He was thirsty after his hours of travel, so stopped to drink of its water. There was no refreshment available to man to match that of water after thirst!

A policeman riding a horse saw him. "Don't drink from that, mister!" the officer bawled, alarmed. "It's polluted!"

Hiroshi stood up and made a bow. "I thank you for your gracious warning. But there is no danger."

The policeman looked at him a moment. "Hey—don't I know you from somewhere?"

Hiroshi spread his hands. "I am a visitor to your fair city."

The officer shook his head as if trying to nail an elusive memory, then decided this was a harmless nut. He rode on, his beautiful horse snorting in the chill.

Hiroshi had been aware of the toxicity of the water. But his *ki* protected him, neutralizing the adverse bacteria and pollutants. He would not suffer.

He continued on around the Pond, then north, not hurrying. He passed the small zoo, now closed for the night, and

came to the Mall. He inclined his head to the bust of each famous man beside it, politely. He came at last to the Lake, skirting it to reach the Ramble, a wooded hill to the north. The night was now advanced, and few people remained in the park. The aimless, hidden paths of the Ramble were forbidding in the heavy shadows, but he walked quickly into the thick of it, following his *ki*.

There was a feminine scream near at hand. Hiroshi stepped toward it, unsurprised. Two white men were holding a struggling black girl under a lamp. They wrestled her down as Hiroshi approached, one sitting astride her head and pinning her arms while the other pried at her legs.

"Please free the girl and depart in peace," Hiroshi said.

The man on her head looked up at Hiroshi, startled, then contemptuous. "Get outa here you little queer before we do the same to you!"

"I regret I must insist," Hiroshi said. "The young lady does not wish to participate."

The other man got his hands on her panties and pulled them down. The girl twisted her body desperately, and the top man slapped her hard across the face. "Don't give me no trouble, nig—"

Hiroshi had drawn alongside, extending his *ki*. He seized the hair of the speaking man and turned the head upward. The rapist's mouth opened involuntarily. Hiroshi delivered a knuckle blow to the nerve center between the ear and the upper hinge of the jaw. The man screamed in agony and fell away.

The other man jumped up, drawing a knife from a legsheath. He was naked below his flapping shirt, but that hardly inhibited him. He lunged, the knife held low, going for the gut.

Hiroshi's left hand moved like the head of a striking snake, sweeping the knife-arm outwards. His right hand, dangling open and loose, whipped against the man's exposed anatomy. It was a devastating strike that knotted the rapist into a ball of agony. It would be a long time before he recovered either the ability or the will to rape again.

The girl scrambled up, wide-eyed. Hiroshi bowed, unruffled. "I regret I employed excessive violence in the presence of a lady. I shall have to meditate upon that flaw in my nature. But I trust you are well?"

She looked at his sandals, his skirt, and his oriental countenance. She was terrified. "Please—let me go!" Hiroshi extended his *ki* once more. "I am Hiroshi, humble teacher of aikido, a system of meditation and self defense. This is

my practice costume, the *dogi*. I heard your distress and came to help. I do not mean to alarm you; as you can see, I am an old man and quite harmless."

That last seemed laughable. Hiroshi was sixty, but hardly harmless. The leading specialists of the world's leading martial arts—karate, judo, wrestling, kung-fu and others—had encountered the little *sensei* in past decades and departed with thoroughgoing respect for his physical and mental prowess. Aikido was no mean discipline, and he was the leading practitioner of his time.

Nevertheless, what he said was true. He was a man of peace, and considered himself primarily a teacher. When force was required, he employed it—but only as a necessary resort, and then with genuine regret.

The girl had no way of knowing this. But his *ki* reached out, pacifying her, and her fear abated. "I—I'm sorry," she said. "I was driving across the park on the transverse road, and my motor quit. I—these men offered to help, but before I knew it—"

"We shall go to your car," Hiroshi said. "Perhaps it is feeling better now."

It did not occur to her to argue. They walked north toward the road. "I had to deliver some important papers, and my apartment was just across the park," she said, her tension making her speak rapidly. "They were for tomorrow's session—I work at the UN—I just don't know what happened to my car—it wasn't out of gas! You're Japanese, aren't you?"

"I am." Her car was just past one of the underpass tunnels employed to keep transverse traffic clear of the park proper.

"It just stopped," she repeated. "And wouldn't start. I ran down the battery trying to—"

Hiroshi put his hand on the hood. He extended his *ki*, seeking rapport with the needs of the motor. "Please try once more," he said.

"I *told* you—the battery's dead!" But she tried the starter.

Some power had regenerated during her absence. The motor struggled over, once, twice—and caught.

"It's running!" she cried unnecessarily.

The sound of horse's hooves approached. The mounted policeman came up. "Lady, don't park here!" he cried. "The park's dangerous at night—don't you know that?"

She began to laugh, hysterically. Hiroshi walked around the car and put his hand on hers, and she calmed. "It's all right, officer!" she said. "It stalled, but he fixed it somehow. And—"

"Merely coincidence," Hiroshi said. "I know nothing of motors."

The policeman squinted down at him. "You again! If you're molesting this woman—"

"No, no!" she cried. "He's my friend! Let me give you a ride, Mr. Hiroshi!"

"I am most grateful," Hiroshi said. "But this is not the favor I require from you. Please go your way."

"Get moving, lady!" the officer brayed.

She drove off.

The policeman stared at him. "Hiroshi, she called you. I know that name! *Thought I placed you! Aikido!*"

Hiroshi bowed. "It is of no importance."

The man jumped down from his horse. "I'm taking you into the station! Come along now—"

Hiroshi's motion was so slight as to seem insignificant—but it was the policeman's arm that ended in the submission lock, not the little teacher's.

"Hey—do that again!" the man exclaimed as Hiroshi released him. "Slow motion!"

He reached for Hiroshi's arm again, slowly, and the *sensei* made his move again, slowly. "You must use your opponent's *ki* against him," Hiroshi explained. "Then he defeats himself."

"You *are* him! That's what I wanted to know! I saw your picture in the book when I studied the comealongs. The top man since the founder died! But we have so many kooks around here, I just had to check. How come you're in New York?"

"I have minor business here," Hiroshi said. "I am glad you have profited from my book."

"Hey, the chief'll want to meet you! You're just about the toughest fighter in the world, aren't you?"

"The mental discipline is far more important than the physical, and the peaceful solution is always best."

"Not around here it isn't!" the officer said jovially. "These muggers and perverts—oh, you mean the *ki*. Well, I never did understand about that, much. But I heard you can do things with your mind, like telepathy. That right?"

"I do no more than you could do, with proper training," Hiroshi said. "*Ki* is inherent in everyone. I regret I can not visit your chief at this time."

"Okay," the policeman said regretfully, remounting. "I sure won't try to tell *you* what do do! But watch yourself around the park, will you? It's a rough beat!"

Hiroshi bowed. "I shall do so, sir."

The man trotted off with a friendly



wave. Hiroshi walked south along the pleasant paths.

He came again to the little zoo, and climbed over its wall. Inside was a large plaster whale with a wide-open mouth. Goldfish swam in a glass aquarium inside it. He climbed in and curled up on the whale's tongue, sheltered from the bitterly cold wind, and relaxed.

I am hanging over a pit of wild tigers, he thought. Only the rope about my waist sustains my weight. A beaver is gnawing on that rope. I see some wild berries growing on the fringe of the pit, just within reach. I pick one as the last strand parts . . .

His eyes closed and he felt warm all over as he drifted to sleep. *How sweet it tastes!*

The sweet taste of the berry remained in his mouth as he woke. Dawn was near; attendants would be arriving soon. He climbed out of the whale, turned to make a formal bow to it, then climbed nimbly out of the zoo.

It was in his power to do what he would with the world, but his power was uncontrolled, untested, and eventually unavailing as lesser power backed by greater discipline negated his demands.

He was hungry, despite the berry. He had not eaten since leaving the airplane. But his business was now too urgent to permit further loss of time—and fasting was good for the spirit. He drank again from the Pond and proceeded on out of the park, south on Fifth Avenue—admiring the glittering stores—then east on 42nd Street.

First he saw the massive Secretariat Building, with its phenomenal expanse of glass. Then he saw the wide plaza and the row of flags of all the member nations; Japan's was the most beautiful. He entered the General Assembly Building's main lobby, locating the Information Desk.

There was the girl he had saved from a fate worse than rape. "Mr. Hiroshi!" she exclaimed, her dark face lighting. Then her mouth tightened, for she did not want her employers to know about the park incident.

"If it is not too much to ask," Hiroshi said, inclining his head politely, "I should like to attend the General Assembly meeting."

"No trouble at all, Mr. Hiroshi!" she said, flustered. "We have regular tours!" "I do not wish the visitor's tour. I must attend with the delegates."

"You don't understand, Mr. Hiroshi!" she protested. "No visitors are allowed on the assembly floor during a business session! You would have to have a special pass—" She paused. "Or is that what you mean?"

Hiroshi nodded. "It is necessary."

She bit her lip. "After what you did . . . look, I—please don't tell anyone! I wouldn't do this for anyone else in the world, but—here's a pass for the guest of a delegate. I'm sure this one won't be used today. I'd lose my job if—"

"This is most kind of you," Hiroshi said, accepting.

He entered the main assembly hall with the delegates, his pass clearing the way past the guard. It was like an amphitheater inside, with many rows of chairs. He peered up at the huge, tall dome admiringly. "What a magnificent *dojo*!" he murmured, thinking of his own small practice hall.

He made his way to the Cuban delegation. "Please," he said to the delegate in Spanish. "May I speak to the exile?"

The man faced him, displeased. "There is no Cuban traitor here, *senor*! Only true Revolutionaries. And I do not believe I know you."

"I must apologize for the misunderstanding," Hiroshi said humbly. "I thought perhaps the man entered as your guest."

"No guest! If someone is using my

pass—"

Hiroshi laid down his guest pass. The delegate's face became grim. "This is mine! Who—?"

"I fear he means mischief. Would you be so kind as to contact your office and ascertain—?"

"I shall certainly check it out!" the man said angrily, picking up the pass. "This should never have been issued!"

Now Hiroshi moved to the Japanese delegation and took a seat. The delegate looked at him and did a doubletake. "Are you not Hiroshi, the aikido *sensei*?" he asked in Japanese. "What brings you here?"

"This is not readily explained."

The man frowned. "*Sensei*, I have the utmost respect for your motives. But you can not remain here. This is the United Nations, and an important session is about to begin. If you will go to my office in the Secretariat Building, I will speak to you as soon as I can."

Hiroshi only smiled—and remained. Seeing that he would not be moved, the delegate put the best face on it and let him be.

The President of the General Assembly called the meeting to order.

A wild-haired man barged in, pursued by two guards. He charged toward the Speaker's rostrum. Suddenly he stopped, whirled about, and gestured at the guards. "Killers!" he cried in high-pitched Spanish. "Shoot! You can't touch me!"

Both guards drew their guns and fired. The noise was deafening. But the bullets went up into the dome—shot after shot, until the guns were empty.

Then there was silence. Astonishment and dismay showed on the faces of the two guards—and in the assembly.

The Speaker was furious. "What is the meaning of this?" he cried in French. Hiroshi heard the English translation in his earpiece.

"Shut up!" the intruder cried, still in Spanish.

More guards rushed in. "Remove this man!" the Speaker said. It was obvious that neither he nor the intruder understood the other, but their tones made their meanings clear.

One of the first two guards hurled his pistol at the Speaker. The missile missed, crashing into the glass-enclosed floor where the press and translators worked with such force that it cracked the unbreakable glass. Spiderwebs ran in all directions from the center of impact.

The intruder climbed to the Speaker's rostrum. "Shut up, all of you!" he cried again. "I am Mario Garcia! I am a slan, a clear, and the true President of Free

Cuba, and now you all *listen to me!*"

The delegates, shocked, listened to their earpieces, hearing his words in one of the five official languages. But many did not get the word, because the strike at the translators' booth had brought a number of the translators to their feet, gaping. The six reinforcement police stood unmoving, while the President and his staff quietly cleared out. Only the news-hungry television camera crew kept operating, broadcasting it all.

"I am the only sane man in the world!" Garcia cried into the mike. He was a tall, thin, nervous young man with very light hair and reddish white skin—almost albino. His eyes were blue and seemed weak, not tracking properly, though he was not wearing glasses. "I am the only one fit to rule, so you'll have to make me King of the world!"

No one answered. Everyone seemed to be waiting for someone else's initiative, with many shaking their heads in bewilderment. Even the English translation was out of commission now; but that made no difference to Hiroshi. He watched the wild young man closely, studying his every move.

"I am a Doctor of Scientology!" Garcia cried. "And a black belt in judo! And founder of the SLF! Now elect me King of the world—or I'll destroy you along with the Communists!"

Still no one replied, and the guards remained strangely inactive. There was an increasing murmur among the delegates. Hiroshi rose and walked toward the Cuban delegation.

"See, I'll show you!" Garcia said, gesturing with both his arms. "I control metal. I have telekinesis! I have telepathy! I am a slan! You are powerless against me!"

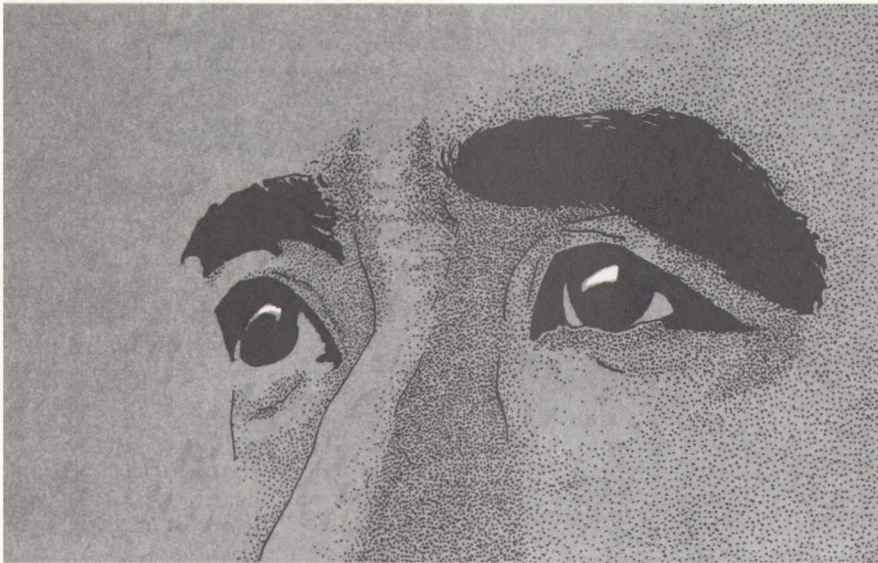
The Cuban delegate spied Hiroshi and gestured him close. "*Senor*, you were right!" he whispered, tapping his scribbled notes. "I called my office, and we have a file on this madman. His mother was a santera, that *espiritismo* cult. His mind became unhinged when his family lost its illgained fortune, and he became a traitor to his country and left Cuba. How did you know he was here?"

"The *ki* led me," Hiroshi said, not quibbling about definitions. To the Castro government of Cuba, anticommunist was interchangeable with traitor. "Please—more information?"

"You can do something?" The delegate paused, alarmed, as the remaining guards fired a volley into the dome. "The madman I comprehend; he is mad! But what is the matter with guards?"

"It is necessary first to understand Garcia," Hiroshi said gently.

Desire was not enough. Though he had the power, and the desire to use it, he had not the discipline he needed to defeat the one old man who stood between him and world conquest. And without that discipline, his plans were but the sand castles of children, erased by the sea.



“Yes!” The delegate brushed back his dark hair. “I made notes from the telephone. Garcia is from a volatile family, but he is highly intelligent. Good marks at Havana University, but he left in mid-term to study something called ‘Scientology’ and seems to have done well there too. And judo, despite a sickly nature and bad eyesight. First degree black belt, before dropping out. Some experience with LSD, but he doesn’t seem to be a drug addict. Apparently he has tremendous drive, but little staying power—apart from his madness.”

Hiroshi nodded. “So the credits he claims are accurate. But what is this ‘SLF’ he names?”

“There’s something about that too. He is a science fiction enthusiast—a ‘fan.’ He founded a club—” he leafed through his notes, finding the place—“here: ‘Slans Lunatic Fringe,’ devoted to the works of A. E. van Vogt, L. Ron Hubbard, and others of the type. Nonsense.”

“On the contrary, señor!” Hiroshi said warmly. “This is relevant. You have told me that he is honest, and has studied aspects of the occult powers of the mind. Mad he may be—but his power is real.”

He moved up the aisle between the chairs, toward the dais, leaving the confused delegate behind.

Garcia was still demonstrating his control. “All metal! All the world runs on metal, doesn’t it? So I am master already!” He glared about. “You!” he cried, pointing at the delegate from Holland. “You are convinced now?”

Someone whispered a translation. The man shook his head scornfully.

“Your metal watch!” Garcia said. “I lift it—thus—” The man’s left hand jerked up. “And over—thus!” The man’s fist smashed into his own jaw. He fell back in his seat, his lip bleeding. “Now do you believe?” Garcia yelled triumphantly.

The man looked at his watch, then back at Garcia. The shock in his face was answer enough.

“I can as readily make the guns of the guards kill you!” Garcia continued. “I can rip out the metal girders of this building and bring the vault down about your heads! There is no limit to my power! I am the world’s first true Clear!”

Hiroshi extended his *ki*. It met the powerful, aberrant force of the Cuban,

related to *ki* but lacking its restraint. *Ki* was akin to the force and goodness of the human spirit, while Garcia’s variant derived from frustration and insanity. In a more devious respect, the two complemented each other as evil complemented good.

“Now make me King of the world!” Garcia cried again to the group. “Before I destroy you all!”

Hiroshi approached him, knitting his fingers in the *Kuji-Hiri* exercise. “I regret this is impossible,” he said politely. “Please desist and come with me.”

“You dare?” Garcia demanded with a quiver, his eyes watering as he focused on the little man. “I’ll bash your head in with your own watch!”

Hiroshi held up his wrists, continuing the hypnotic *Kuji-Hiri* motions. He wore no watch, no bracelet, no ring.

“I’ll shoot your own coins into your eyes!”

Hiroshi shook his head. “I have no money.” He was very close now, his fingers working in marvelously intricate patterns.

Garcia tore his gaze away from those fingers. “You’ll still die!” He gestured to a guard, and the man’s gun leveled.

Hiroshi extended his *ki*. This was why he had saved it, using the finger-hypnotism instead. He could not use his *ki* in two ways simultaneously, and could not match the sheer raw power of the youth. But he could begin to rein in Garcia hypnotically, while using his *ki* to interfere with the man’s paranormal control. Just a little job of the gunman’s elbow, as it were, as he fired . . .

The gun went off. The shot went wide. It had worked! “I, too, am a kind of clear,” Hiroshi said softly. He was not familiar with the term, but that did not matter.

Garcia stared . . . into the winding fingers. “You lie, you little Jap!” But he must have felt the *ki* interference, and he sounded uncertain.

One of the thrown pistols lay in the dais. Hiroshi picked it up. “I control this metal. Take it—if you can.”

Challenged specifically, Garcia concentrated. His force leaped out, surrounding Hiroshi, tearing at his control. If he *could* take over, Hiroshi was lost! But that power was untrained and unruly, not focused to best advantage. Hiroshi hung on, his *ki* extended to the utmost. He had never before braved an attack such as this!

The gun quivered—but did not leave his hand. He had withstood the storm!

“Now I shall move it,” Hiroshi said, as though he had never felt the struggle.

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SPINOFF

from page 37

substance, every element, reflects or radiates a distinctive signature across the spectrum, not unlike the fingerprints of a man. Photography by film sensitive to these radiations provides hitherto unavailable information concerning natural resources. Thus with the proper use of this information, a pattern of resource supply can be matched with resource demands.

Through space-borne observation, our geologic knowledge investigates Earth's composition, structure, stratigraphy and history. Geologic features can be mapped regionally. Eventually, with the help of laser reflectometers carried to the Moon by Apollo, we can develop methods for monitoring and predicting natural disturbances such as earthquakes and volcanic upheavals.

Mineral resources—iron, copper, gold—and non-metallic deposits—sand, gravel, limestone, oil and gas—can be detected and measured from space.

Electromagnetic energy and the electrical properties of rocks and terrain are even more effectively observed from space than from the limited height of aircraft observation. Gemini and Apollo photographic observations provided the first, all-inclusive views of the Himalayas and the Andes, the practical applications of locating new oil deposits in Australia, and a photo mosaic of Peru more accu-

rate than any map.

Two-thirds of Earth is covered by oceans. They can be seen in their vastness only from a distant point in space. Just such a view can be utilized to increase our understanding of the oceans, to utilize them as a medium of transport, to detect their influence on weather and climate, and to evaluate them as food sources.

Several techniques of collecting oceanic data by satellite are in use or development:

State of the sea—relationship between wave height and wind force.

Thermal conditions and temperature of the sea surface.

Sea ice—one of the first oceanographic features pictured by the first U. S. meteorological satellite, TIROS, in 1960.

Location of currents and water masses by thermal characteristics and coloration.

Mapping coastal areas—an aid in detection of shifts in shoreline resulting from flood and storm.

Movement of biological phenomena in the oceans, discernible by heat or color, implies a possible relationship between concentrations of fish and marine organisms—of great value to commercial fishing and the wise use of resources.

The spinoff of space technology runs the gamut from new industries to better smoking pipes.

Medicine has been one of the biggest beneficiaries of space research. The merging of bioscience and engineering forced by the demands of adapting man to space created many new medical devices and techniques.

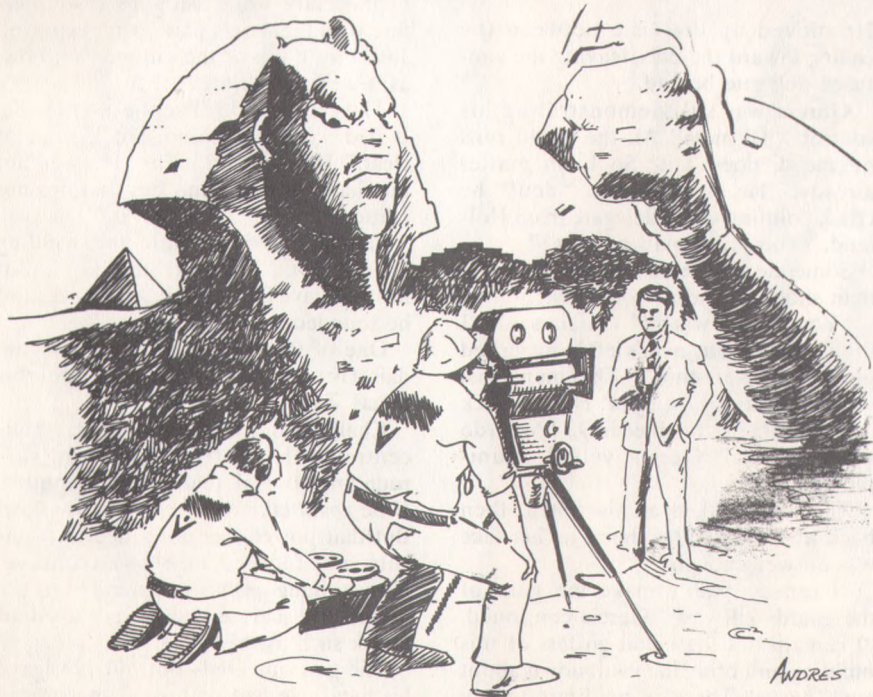
Dry, spray-on electrode techniques permit taking an electrocardiogram in the ambulance enroute to a hospital. Sensors smaller than the head of a pin can be inserted into a vein to measure blood pressure without interfering with circulation. An automatic living cell analyzer can produce almost instantaneous blood counts. A switch can be operated by the eye movement of a paralyzed patient. A telemetry unit monitors cardiac patients in intensive care.

A new type of pipe, built of plastic mortar, reinforced with fiberglass, is light, thin-walled, non-corrosive and virtually indestructible. A polyurethane spray foam is used to insulate the hull of a tuna ship. An aluminized plastic half a thousandth of an inch thick becomes an emergency blanket.

An electromagnetic hammer is used to build ships and autos. There is a new plastic material for packaging meat. Foamed resins have been used to refloat sunken ships. Better adhesives bond auto trim. A fire resistant material transforms into soft and resilient garments. Semiconductors three-sixteenths of an inch thick contain more than 1,000 circuits. An anti-skidding device has been applied to tracks. Computer programming has been adapted to such diverse uses as an instant flight and reservations system for airlines and the rapid handling of stock market transactions.

Other and less tangible spinoffs from space have been catalogued. Basic knowledge has been enriched in many fields—in biosciences, physics, geology, astronomy, and engineering. Space has been our best salesman abroad. It has demonstrated our capabilities, our good will, and enhanced U.S. prestige throughout the world.

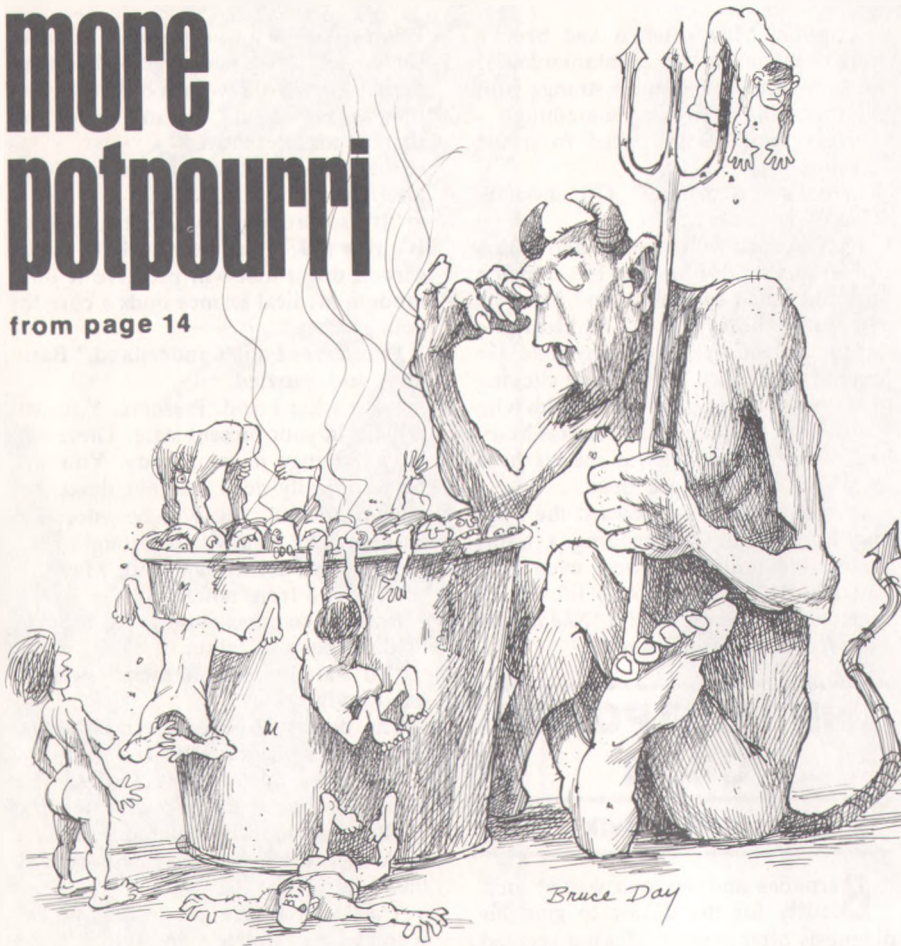
The transfer of new knowledge derived from space exploration continues, even though the man-in-space program which gave birth to it has, at least for the time being, ended. To be perfectly honest, there is no one, in NASA, in any of the contractors who took part in the program, in any of the space experts who write about the program, who has the foresight or ability to totally predict the possible advantages which will accrue to us from our adventure in space. ○



"... Erich Von Daniken goes on to suggest that the ancient sphinx may represent space travelers that came to Earth hundreds of years ago."

more potpourri

from page 14



The Sea raised a tidal wave questioningly. The Land pointed a peninsula at the Moon. "The Moon is Land," he said, "and you have never been to the Moon."

The Sea slunk away, defeated, for the Land was right. The Sea had never been to the Moon.

The Sea sulked for a very long time, tearing down a cliff face here, grinding rock to sand there, but never really bothering the Land very much.

And then the Sea had an idea. Within its warm fluids it created tiny little bags (called cells) in which to carry itself about. It put these cells together into more and more complex patterns until finally it found one that could slither up on to the Land. Once it got the knack of it, the Sea was able to make many different kinds of cell-groups which could carry it about on the Land.

"Well," said the Land, itching all over as the Sea scurried this way and that in myriads of little cell-groups, "that certainly was clever of you. It's not quite the same as the old days when you covered everything. But you've definitely made your presence felt again." And the Land quaked several dozen dinosaurs

into some tarpits so it could get some rest.

"But," added the Land in a superior tone, "you still haven't gone to the Moon."

The Land was right, and the Sea felt ashamed again. So it pattered around for a long time, trying this shape and that, looking for a way to get to the Moon.

Then it chanced on the idea of a packet of sea water intelligent enough to make a tool to carry it to the Moon. Intelligence and technology. Those were the keys.

Finally, in tiny little containers called Armstrong, Aldrin and Collins, the Sea went to the Moon.

The Land was forced to admit that the Sea had pulled a good one that time. They had a good laugh about it.

"What will you do now with all those little packets you've made to help you get to the Moon?" the Land asked the Sea.

"What? Men? I won't need them anymore," the Sea replied. "They're too complex and artificial to survive on their own. If I simply let them alone, they'll

ebb back into the Sea again."

In a very short time the little containers of seawater stopped going to the Moon, and soon they ceased to exist all together.

The Sea and the Land, of course, lived happily ever after.

IN AN ALIEN INN

by Damon Castle

Dutch Vander slid out of the Jeep and almost fell flat on his nose. As he staggered to regain his balance, he saw the light from the twin moons glinting on their ship at the port. He could see the dark forms of the barracks at the edge of the landing strip and the ribbon of road that wound through the valley, disappearing in the mountainous clefts.

This was a small village—much smaller than the one where the gooks had built their US INN.

He raised a hand to help Mary down from the Jeep's rear seat. "So thish is where you live, huh. Mary?"

Her tentacle slid around his hand as she stepped down from the Jeep. She nodded. Dutch wrapped an arm around her waist and they headed toward the nearest hut. He looked over his shoulder at Dave and Gil, taunting. "Bet you guys . . . jealous ash hell, huh?"

"You're crazy," Dave said.

"I'd rather make it with an octopus," Gil said.

Dutch laughed. Still holding Mary's tentacle, he followed her through an open doorway. He waited for her to light a candle or turn on a light but she went to one corner of the hut and seemed to be mixing something in a small pot. It was so dark he could hardly see her antennae, so he soon gave up trying to see what she was doing.

He looked out the window. Dave and Gil were still in the Jeep, smoking cigarettes. He could hear them laughing.

Laughing at him?

No one had ever made it with one of the local females. The port was only two weeks old and the planet had been discovered just a month ago. No one knew all the customs and traditions and so forth—the interpreters were still learning the language.

He had a reputation. Dutch thought proudly. He had so far made it with every type of female in the universe.

Guys like Dave and Gil might laugh now but they wouldn't laugh long. As the most virile member of the United States Advance Interstellar Expeditionary Group, he was always there first with the most to sample the females of each newly discovered world. None of the other guys had his nerve or his guts. Some of the females on the various worlds had been good but most had been weird in one way or another.

Mary came close to him, extended her tentacle. She held a sort of plate with cookies on it. He took one and munched it. "Cookies and tea before we make it, huh? Great."

Since he didn't see any chairs, he sat on the floor, leaning against the wall. Mary left the plate of cookies by his hip and went to the other side of the room where she sat, facing him. He ate all the cookies and then lit a cigarette.

"What do we do now?" he asked the alien girl. "We wait around awhile, huh?" He puffed on the cigarette.

Minutes ticked by. He said, "Why is it every planet has a girl named Mary?" No matter whether they looked like snakes or frogs, they always had a girl with a name that translated into 'Mary'.

He finished the cigarette and stubbed it on the floor. He wondered if this Mary was married or engaged. That thought reminded him of the alien males. He hadn't seen many of them—they were quieter than the males on most planets. More than half of them, he'd noticed, had huge stomachs and bloated tentacles as if their females fed them too much. Or else they didn't work hard enough. It seemed the females did all the work on this particular gook world and the males stayed home with the kids, just taking it easy. He thought, It's probably not a bad life if you don't mind crying brats.

"When are we going to do it, Mary?" he asked, knowing she wouldn't understand the words. At the Inn, he'd bribed one of the Group interpreters to make the arrangements and settle on the price. The interpreter had explained that he, Dutch, wanted to have sex with her and he'd already paid her. She was a barmaid at the Inn and, although she looked like something in a nightmare, he'd known she could be bought. You could buy almost any female on any planet if you had enough money and gook barmaids were the cheapest of all.

"How do we do it?" Dutch asked, grinning in the darkness, knowing she wouldn't answer. He had made it with types that looked like gorillas and vegetables and reptiles and things beyond

description. Most often it had been a more or less ordinary sexual intercourse but sometimes it had been strange stuff like squeezing or stroking something. . .

"Hurry up!" Dave called from the Jeep.

"What's the matter?" Gil shouted. "Can't you get it up?"

They howled with laughter and Dutch cursed silently. He burped. His stomach hurt. He felt it swelling. Gas? Must be gas. Butterflies inside. . . Suddenly he felt sweaty and sick. The pains grew. He jumped to his feet. Things were clicking in his mind, adding: the alien males who stayed with the young, the cookies Mary had given him and the way she sat there so quietly while he ate them. . .

He ran outside, ran toward the Jeep and Dave and Gil, holding a hand against the things that were even now fantastically squirming with life in his stomach, screaming shrilly, "*She did it! I'm pregnant! I'm pregnant!!*"

THE POSTPONED CURE

by Stan Nodvik

Barnabas and Winona waited anxiously for the doctor to give his diagnosis after a week of what seemed endless tests. The doctor leaned back in his chair and stared unflinchingly at Barnabas and said: "I'd like to level with you, Barney, and tell you the truth. Some medical men believe in keeping something like this from the patient but—"

Winona reached over and clasped his hand for support as Barnabas interrupted. "Give it to me straight, Doc."

"You have six months to live."

Winona gasped and flung her arms about Barnabas's neck. Clinging to him she whimpered softly as the doctor continued to speak.

"You have a rare disease, Barney. One that we know very little about. A disease for which there is no cure—" The doctor paused and, glancing down at his laced fingers, added in a suggestive tone: "—unless. . ."

"Unless what?" Barnabas asked quickly, his voice grabbing at the hint of a remedy like a drowning man trying for a floating life preserver.

"Unless you take what I'd like to call, the postponed cure."

"The what?"

"The postponed cure. It's not actually a cure. It's the chance for a cure. The chance to live to a ripe old age. Listen,

Barney. You're a young man." The doctor looked down at the records on his desk. "Twenty-three years old. It is a pity that a man should die so young. But there is an alternative."

Winona cried out in anguish. "What alternative?"

"It's something new. A new method. It's like this: Your body will be given certain drugs that will preserve it until modern medical science finds a cure for your disease."

"Preserve? I don't understand," Barnabas said, puzzled.

"Just what I said. Preserve. You will remain in your present state. There will be no change in your body. You will be technically dead, yet not dead. Let me say instead, you will be asleep, in a deep sleep. You will be brought back to life when a cure is found. Maybe a year or two from now."

Both smiled, welcoming the thought of Barnabas's salvation.

"I'll wait for you, Barney," Winona cried joyfully.

The doctor dispelled their smiles by adding: "Or maybe *years* from now."

The faces full of joy collapsed like putty. Winona made an o with her lips.

"But will they be able to bring me back to life when. . . whenever they find a cure?"

"Oh yes. Certainly. They've researched it completely and tested it. It's merely a matter of drugs. They give you one drug and you're like petrified wood. Then later when the time comes they give you another drug and you're alive and well."

"Reborn," Winona said in awe.

"Yes, I guess you could say that. There is only one drawback. It costs a great deal of money. This is something completely new, you understand. And for the present time quite costly."

Winona laughed. "Money is of no object. My family are important people. My father left us plenty when he died."

"Well then," the doctor said, standing to signify the conclusion of the interview, "in that case it's a matter of choice. You, Barney, must decide whether you want to live another six months or else take the chance for the postponed cure and for greater longevity. And you, Winona, must decide whether you will wait for Barney. It may be a long wait. Very long."

Winona looked into Barnabas's eyes and smiled. "We have decided. I will wait."

Barnabas opened his lips to speak, but Winona silenced them with the tips of her fingers. "I will wait!" she said.

The curator, seated on his stool amidst the preserved bodies, read the article in the newspaper and marvelled at the wonders of science. Finally they had found the cure for . . . for . . . whatever-the-hell-it-was. He could not pronounce the name of the rare disease even though he slowly mouthed the syllables several times. He shook his head in puzzlement and gave it up.

Then he read the article one more time before he heard the noon-hour chime of the bells outside. He folded the newspaper and tucked it under his arm and headed for Gino's for lunch, leaving the Egyptian mummy room of the Philadelphia University Museum in a hurry.

THE VERTEX URBOMAX-NEWS HEADLINES

for

April 25, 2003

The following is a selection of news headlines from the Urbomax-News, the Frisco-LA urbomax's leading newstape.

ENERGY CRISIS, AGAIN

The Real Crunch Is Yet To come, Says World Energy Czar from Las Vegas Headquarters.

KISSINGER REPORTS TO PRESIDENT M'KUMBA ON VIETNAM PEACE TALKS

Claims Burmese Invasion of the Federation of Vietnams a Grave Threat to Peace.

HARLAN ELLISON SPEAKS BEFORE KIDDIE-LIB GROUP

Perennial Lib-Group Speaker Says: "Five-Year-Olds Are People, Too."

BOB HOPE SCHEDULES TROOP VISIT

Bob Hope Today Announced Plans To Make A Front Line Visit To Our Men In Antarctica.

105 KILLED FOR THREE HOURS AFTER BOEING 792 HITS SPANISH PEAK IN FOG

Revival Delayed While Rescue Party Separates Sheep From Human Remains At Crash Site. Reports Of Man-Goat Mixup Denied.

DEMOCRATS CHARGE REPUBLICANS WITH CAMPAIGN DIRTY TRICKS

Say Republican National Committee Financed Plan To Revive Corpses Of Demos Purged in Convention of '93.

SUPREME COURT RULES ON PORNOGRAPHY

Declares "Deep Throat" Legal For Those Over Ten. Orange County 15-Year-Old-Minimum Law Declared Unconstitutional.

EMPEROR NIXON DECLARES WAR

Head Of U.S. Monarchy-In-Exile, From His Temporary Capitol On Adak Island, Declares War On The World. Promises "Make No Mistake About It, I Will Return!"

CHARLETON HESTON SIGNS FOR NEW PART

Just Out Of The Rejuv Tanks, screen superstar Heston Signs To Play Jesus Christ In "Second Coming." Says Part Was Written Specifically For Him.

POLICE RECOVER TIM KIRK PAINTINGS STOLEN FROM NEW YORK MUSEUM

Two Fellowship of the Blue Imperial Dragon Stoooges Held in Theft.

THE WEATHER FOR TODAY

Rain scheduled from 2:30 AM to 4:00 AM U.S. time, followed by three lightening strikes in Yosemite Natl. Park and a 30 foot tidal wave at the Hawaii Natl. Surfing Park at 9:00 AM. Otherwise clear and sunny with a temperature of 76.4.

ISRAELI OIL TO DOUBLE IN PRICE

Saudi and Kuwait Fields to Increase Price to All Except Two Remaining Arab States, Who Still Cannot Get Oil At Any Price.

ROBERT SILVERBERG HONORED AT DINNER

Presented With Hugo Award As Most Pessimistic Writer Of 20th Century.

FORMER PRESIDENT REGAN ACCUSES FORMER PRESIDENT KENNEDY WITH MEDDLING IN THE ELECTION OF FORMER PRESIDENT WALLACE

Stated Clan Leader Attempted To Buy West Virginia Primary For Senator Sinatra.

HEALTH OFFICIALS SAY WIREHEADING MENACE HAS PASSED PEAK

Current-Use Drop Indicates Kiddies Are Finding New Ways To Get Kicks.

PHASE 19 STARTS

Economy Office to Enforce Controls on Toilet Tissue Hoarding.

U.S. POSTAL SERVICE ANNOUNCES RATE INCREASE

First Class Mail To Go To 50¢ According to Postmaster General, Who Also Promises One Week Delivery Between Coasts.

NEW BRANDO FILM OPENS NATIONWIDE TODAY

Marlon Brando II Stars In "The Grandson Of The Godfather Returns To Foxtrot In Paris (again) (yellow)."

NADARITES CITE DANGER

Prove Law Of Gravity Dangerous To Health—Demand Repeal. House Of Representatives To Act Tomorrow.

IN THE HOUSE OF DOUBLE MINDS

from page 33

this. They are able—I do not know how, no one who is not an oracle can ever know how—to transmit the unique insights of fully mature and wholly independent Rights to their Lefts, which can transmit them to the rest of us. It is a difficult and imperfect process; but it gives us access to levels of knowledge that few have ever reached before our time. Those who master that skill are our functional oracles. They dwell in realms of beauty and wisdom that, in the past, only saints and prophets and the greatest artists and a few madmen have reached.

I would, if I could, have entered those realms. But I came forth left-handed from the womb and my brain, though it is a decent one, therefore lacked the required asymmetry of function. If I could not be an oracle I could at least serve them, I decided. And thus I came here as a girl, and asked to be of use, and in time was given the important task of easing the new children into their new lives. So I have come to know Jen and Timas and Jalil and Runild and the others, some of whom will live to be among the most famous of oracles, and so now I welcome Hirole and Mulliam and Gybold and Galaine and their companions. And I am content, I think. I am content.

We gather in the main hall for the evening meal. My new group has not come before the older novices until now, and so my twelve undergo close scrutiny, which they find embarrassing, as I lead them to their place. Each year-group sits together at its own circular table. My dozen dine with me; at the table to my left is my group of last year, now in Voree's charge. Runild sits there with his back to me, and his mere presence creates a tension in me as if he is giving off an electric radiation. To my right is the third-year group, reduced now to nine by the culling of Timas and two deaths; the fourth-year children are just in front of me and the fifth-year ones, my darling Jen among them, at my rear. The older children are in the center of the hall. Along the sides of the great room are the tables of the instructors, those who have daily care of the ordinary education of the twelve groups of novices, and the senior oracles occupy long tables at the hall's far end, beneath a panoply of gay red and green banners.

Steel makes a brief speech of welcome for my twelve and the meal is served.

I send Galaine to Voree's table with

a note: "*See me on the porch after dinner.*"

My appetite is poor. I finish quickly, but I stay with my group until it is time to dismiss them. All the children troop off to the auditorium for a show. A warm drizzle is falling; Voree and I stand in the shelter of the eaves. She is much older than I am, a stocky woman with kinky orange hair. Year after year I pass my fledglings on to her. She is strong, efficient, stolid, insensitive. Runild baffles her. "He's like a monkey," she says. "Running around naked, chattering to himself, singing crazy songs, playing pranks. He isn't doing his lessons. He isn't even doing his disciplines, half the time. I've warned him he'll be culled, but he doesn't seem to care."

"What do you think he wants?"

"To have everyone notice him."

"Yes, surely, but *why*?"

"Because he's a naturally mischievous boy," Voree says, scowling. "I've seen many of his sort before. They think rules are for other people. Two more weeks of this and I'll recommend a cull."

"He's too brilliant to waste like that, Voree."

"He's wasting himself. Without the disciplines how can he become an oracle? And he's upsetting all the others. My group's a shambles. Now he's both-ering yours. He won't leave his sister alone either. Culling, Mimise, that's where he's heading. Culling."

There is nothing to be gained from talking to Voree. I join my group in the auditorium.

Bedtime for the younger ones comes early. I see my children to their room; then I am free until midnight. I return to the auditorium, where the older children and the off-duty staff are relaxing, playing games, dancing, drifting off in couples. Kitrin, Runild's sister, is still there. I draw her aside. She is a slender, delicate girl of fourteen, a fifth-year noive. I am fond of her because she was in my very first group, but I have always found her shy, elusive, opaque. She is more so than ever now; I question her about her brother's behavior and she answers me with shrugs, vague unfinished sentences, and artful evasions. Runild is wild? Well, of course, many boys are wild, she says, especially the bright ones. The disciplines seem to bore him. He's far ahead of his group—you know that, Mimise. And so on. I get nothing from her except the strong feeling that she is hiding something about her brother. My attempts to probe all fail; Kitrin is still a child, but she is halfway to oraclehood, nearly, and that

gives her an advantage over me in any duel of wits. Only when I suggest that Runild is in immediate peril of culling do I break through her defenses.

"No!" she gasps, eyes widening in fear, cheeks turning pale. "They mustn't! He has to stay! He's going to be greater than any of them!"

"He's causing too much trouble."

"It's just a thing he's going through. He'll settle down, I promise you that."

"Voree doesn't think so. She's going to request a cull."

"No. No. What will happen to him if he's culled? He was *meant* to be an oracle. His whole life will have been thrown away. We have to save him, Mimise."

"We can do that only if he can control himself."

"I'll talk to him in the morning," Kitrin says.

I wonder what she knows about Runild that she does not want to tell me.

At the evening's end I bring Jen to my chamber, as I do three or four nights a week. She is tall and supple and looks more than her fourteen years. Her counselor tells me she is moving well through her mid-novitiate and will be a splendid oracle. We lie together, lips to lips, breasts against breasts, and we stroke and caress and tickle one another, we smile with our eyes, we enter into all the rituals of love. Afterward, in the stillness that follows passion, she finds the bruise of this morning's struggle on my thigh and questions me with a frown. "Runild," I say. I tell her about his erratic behavior, about Steel's uneasiness, about my conversation with Voree.

"They mustn't cull him," Jen says solemnly. "I know he's troublesome. But the path he's taking is so important for all of us."

"Path? What path is that?"

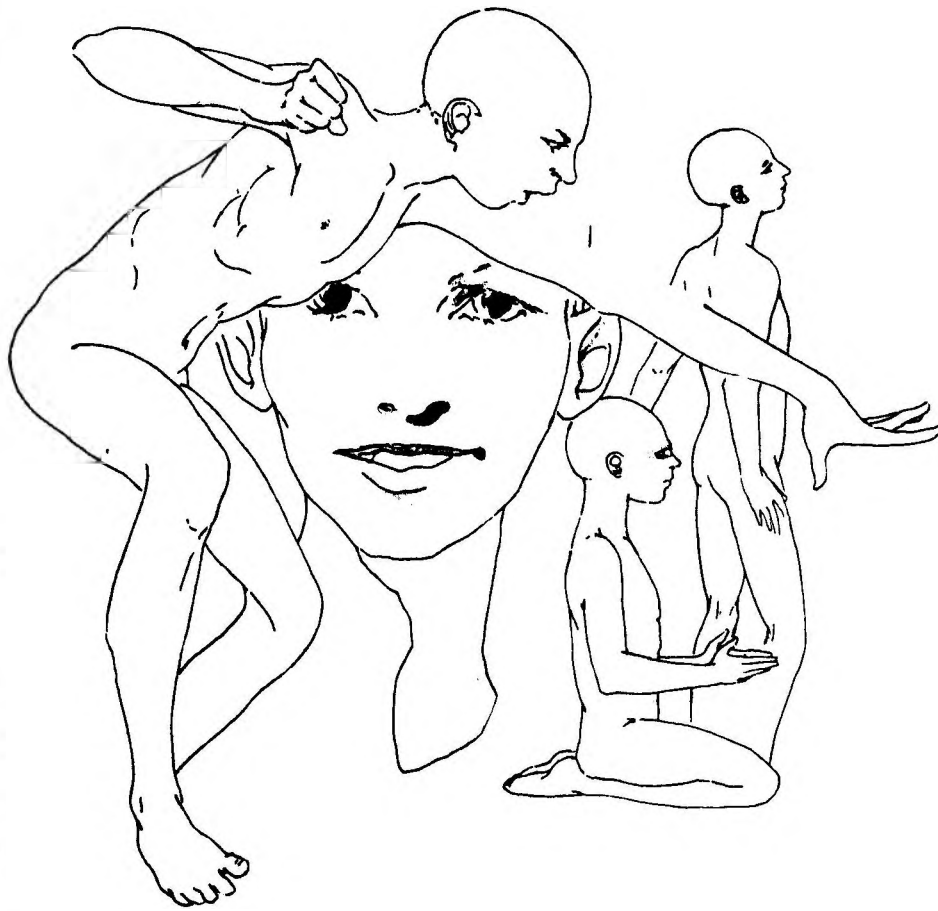
"You don't know?"

"I know nothing, Jen."

She catches her breath, rolls away, studies me a moment. At length she says, "Runild sees into minds. When he puts his head very close to people, there's transmission. Without using words. It's—it's a kind of broadcast. His Right can read the Rights of other oracles, the way you'd open a book and read it. If he could get close enough to Steel, say, or any of them, he could read what's in their Rights."

"What?"

"More, Mimise. His own Right talks to his Left the same way. He can transmit messages completely, quickly, making



He was different in a world different from the real world, and as such he could be considered either a saint and savior, or a danger which could destroy them.

better contact between the halves than any of the oracles can do. He hasn't had the disciplines, even, and he has full access to his Right's perceptions. So whatever his Right sees, including what it gets from the Rights of others, can be transmitted to his Left and expressed in words more clearly even than Steel himself can do it!"

"I don't believe this," I say, barely comprehending.

"It's true! It's true, Mimise! He's only just learning how, and it gets him terribly excited, it makes him wild, don't you see, when all that contact comes flooding in? He can't quite handle it yet, which is why he acts so strange. But once he gets his power under control—"

"How do you know anything about this, Jen?"

"Why, Kitrin told me."

"Kitrin? I spoke to Kitrin and she never even hinted that—"

"Oh," Jen says, looking pained. "Oh: I guess I wasn't supposed to say. Not even to you, I guess. Oh, now I'll be in trouble with Kitrin, and—"

"You won't be. She doesn't need to know how I found out. But—Jen, Jen, can this be? Can anyone have such powers?"

"Runild does."

"So he claims. Or Kitrin claims on his behalf."

"No," Jen says firmly. "He *does*. They showed me, he and Kitrin. I felt him touch my mind. I felt him read me. He can read anyone. He can read *you*, Mimise."

I must speak with Runild. But carefully, carefully, everything in its proper moment. In the morning I must first meet with my group and take them through the second-day exercises. These are designed to demonstrate that their Rights, although mute and presently isolated, are by no means inferior, and have perceptions and capabilities which in some ways are superior to those of their Lefts.

"Never think of your Right as a cripple," I warn them. "See it, rather, as some kind of extremely intelligent animal—an animal that is sharp-witted, quick to respond, imaginative, with only one flaw, that it has no vocabulary and is never going to be able to acquire more than a few simple words at best. Nobody pities a tiger or an eagle because it doesn't know how to speak. And there are ways of training tigers and eagles so that we can communicate with them without using words."

I flash a picture of a house on the screen and ask the children to copy it, first using their left hands, then the right. Although they are all right-handed, they are unable to draw anything better than simple, crude two-dimensional representations with their right hands. Their left-handed drawings, while shakily drawn because of their left arms' relatively backward muscular development and motor control, show a full understanding of the techniques of perspective. The right hand has the physical skill, but it is the left, drawing on the vision of the brain's right hemisphere, that has the artistic ability.

I ask them to arrange colored plastic cubes to match an intricate pattern on the screen. Left-handed, they carry out the exercise swiftly and expertly. Right-handed, they become confused, frown

and bite their lips, hold the cubes long moments without knowing where to put them down, eventually array the cubes in chaotic mazes. Clane and Bloss give up entirely in a minute or two; Mulliam perseveres grimly like one who is determined to climb a mountain too steep for his strength, but he accomplishes little; Luabet's left hand keeps darting across to do the task that is beyond the right's powers, as if she is at war with herself. She must keep the impatient left hand behind her back in order to proceed at all. No one can complete the block design correctly with the right hand, and when I allow the children to work with both hands the hands fight for control, the formerly dominant right one unable to accept its new inferiority and angrily slapping at the cubes the left one tries to put in place.

We go on to the split-screen exercises in facial recognition and pattern analysis, to the musical exercises, and the rest of the usual second-day routine. The children are fascinated by the ease with which their Rights function in all but word-linked operations. Ordinarily I am delighted, too, to watch the newly liberated Rights come to life and assert their powers. But today I am impatient to be off to Runild and I give only perfunctory attention to my proper work.

At last the session ends. The children move off to the classroom where they will receive regular school-subject instruction. Runild's group, too, should be at school until noon. Possibly I can draw him aside after lunch. But, as though I have conjured him with a wish, I see him now, tumbling by himself in the meadow of crimson flowers by the auditorium. He sees me, too; halts in his gambol, winks, smiles, does a hand-spring, blows me a kiss. I go to him.

"Are you excused from classes this morning?" I ask, mock-stern.

"The flowers are so pretty," he replies.

"The flowers will be just as pretty after school."

"Oh, don't be so stuffy, Mimise! I know my lessons. I'm a clever boy."

"Perhaps too clever, Runild."

He grins. I do not frighten him. He seems to be patronizing me; he appears to be at once very much younger and very much wiser than his years. I take him gently by the wrist and draw him down, easily, until we are sprawled side by side in the grass. He plucks a flower for me. His look is flirtatious. I accept both the flower and the look and respond with a warm smile; I am flirtatious myself. No doubt of his charm; and I can never win him by acting as an au-

thority-figure, only as a co-conspirator. There was always an underlying sexuality in our relationship, incestuous, as if I were an older sister.

We talk in banter, teasing each other. Then I say, "Something mysterious has been happening to you lately, Runild. I know that. Share your mystery with me."

At first he denies all. He pretends innocence, but lets me know it is only pretense. His sly smile betrays him. He speaks in cryptic ellipses, hinting at arcane knowledge and defying me to pry details from him. I play his game, acting now intrigued, now eager, now skeptical, now wholly uninterested; we are stalking one another, and both of us know it. His oracle-eye pierces me. He toys with me with such subtlety that I must remind myself, with a glance at his slim hairless body, that I am dealing with a child. I ought never forget that he is only eleven. Finally I press directly once more, asking him outright what strange new gift he is cultivating.

"Wouldn't you like to know!" he cries, and pulls an outrageous face, and dashes away.

But he comes back. We talk on a more serious level. He admits that he has discovered, these past few months, that he is different from the other children and from the senior oracles, that he has a talent, a power. It disturbs and exalts him both. He is still exploring the scope of it. He will not describe the power in any specific way. Of course I know from Jen its nature, but I prefer not to reveal that. "Will you ever tell me?" I ask.

"Not today," he says.

Gradually I win his trust. We meet casually, in corridors or courtyards, and exchange easy pleasantries, the sort I might trade with any of my former charges. He is testing me, seeing whether I am a friend or simply Steel's spy. I let him know of my concern for him. I let him know that his eccentric behavior has placed him in jeopardy of culling.

"I suppose so," he says gloomily. "But what can I do? I'm not like the others. I can't sit still for long. Things are jumping inside my head all the time. Why should I bother with arithmetic when I can—"

He halts, suddenly guarded again.

"When you can what, Runild?"

"You know."

"I don't."

"You will. Soon enough."

There are days when he seems calm. But his pranks have not ended. He finds poor Sister Sestoine, one of the oldest and dimmest of the oracles, and puts his forehead against hers and does something to her that sends her into an hour's tears. Sestoine will not say what took place during that moment of contact, and after a while she seems to forget the episode. Steel's face is dark. He looks warningly at me as if to say, *Time's running short, the boy must go.*

On a day of driving rain I am in my chamber in mid-afternoon when Runild unexpectedly enters, soaked, hair plastered to his scalp. Puddles drip from him. He strips and I rub him with my towel and stand him before the fire. He says nothing all this while; he is tense, taut, as if a mighty pressure is building within him and the time has not yet come for its release. Abruptly he turns to me. His eyes are strange; they wander, they quiver, they glow. "Come close!" he whispers hoarsely, like a man calling a woman to his bed. He grasps my shoulders, he pulls me down to his height, he pushes his blazing forehead roughly against mine. And the world changes. I see tongues of purple flame. I see crevasses opening in the earth. I see the oceans engulfing the shore. I am flooded with contact; I am swept with wild energies.

I know what it is to be an oracle.

My Right and my Left are asunder. It is not like having one brain cleft in two; it is like having two brains, independent, equal. I feel them ticking like two clocks, with separate beats; and the Left goes tick-tock-tick-tock, machine-dreary, while the Right leaps and dances and soars and sings in lunatic rhythms. But they are not lunatic rhythms, for their frantic pulses have a regularity of irregularity, a pattern of patternlessness. I grow used to the strangeness; I become comfortable within both brains, the Left which I think of as "me," and the Right which is "me" too, but an altered and unfamiliar self without a name. My earliest memories lie open to me in my Right. I see into a realm of shadows. I am an infant again; I have access to the first hours of my life, to all my first years, those years in which words meant nothing to me. The pre-verbal data all rests within my Right, shapes and textures and odors and sounds, and I do not need to give names to anything, I do not need to denote or analyze, I need only feel, ex-

perience, relive. All that is there is clear and sharp. I see how it has always been with me, how that set of recorded experiences has directed my behavior even as the experiences of later years have done so. I can reach that hidden realm now, and understand it, and use it.

I feel the flow of data from Right to Left—the wordless responses, the intuitive reactions, the quick spontaneous awareness of structures. The world holds new meanings for me. I think, but not in words, and I tell myself things, but not in words, and my Left, groping and fumbling (for it has not had the disciplines) seeks words, sometimes finding them, to express what I am giving it. So this is what oracles do. This is what they feel. This is the knowledge they have. I am transfigured. It is my fantasy come true; they have snipped that rubbery band of connective tissue, they have set free my Right, they have made me one of them. And I will never again be what once I was. I will think in tones and colors now. I will explore kingdoms unknown to the word-bound ones. I will live in a land of music. I will not merely speak and write; I will feel and know.

Only it is fading now.

The power is leaving me. I had it only a moment, and was it my own power or only a glimpse of Runild's? I cling, I grapple, and yet it goes, it goes, it goes, and I am left with shreds and bits, and

then not even those, only an aftertaste, an echo of an echo, a diminishing shaft of feeble light. My eyes open. I am on my knees; sweat covers my body; my heart is pounding. Runild stands above me. "You see now?" he says. "You see? This is what it's like for me all the time. I can connect minds. *I can make connections, Mimise.*"

"Do it again," I beg.

He shakes his head. "Too much will hurt you," he says. And goes from me.

I have told Steel what I have learned. Now they have the boy with them in the inner oracle-house, nine of them, the highest oracles, questioning him, testing him. I do not see how they can fail to welcome his gift, to give him special honor, to help him through his turbulent boyhood so that he can take his place supreme among oracles. But Jen thinks otherwise. She thinks he distresses them by scrabbling at their minds in his still unfocused attempts at making contact, and that they will fear him once they have had an explicit demonstration of what he can do; she thinks, too, that he is a threat to their authority, for his way of joining the perceptions of his Right to the analytic powers of his Left by a direct mental flow is far superior to their own laborious method of symbolic translation. Jen thinks they will surely cull him

and may even put him to death. How can I believe such things? She is not yet an oracle herself; she is still a girl; she may be wrong. The conference continues, hour after hour, and no one emerges from the oracle-house.

In the evening they come forth. The rain has stopped. I see the senior oracles march across the courtyard. Runild is among them, very small at Steel's side. There are no expressions on any faces. Runild's eyes meet mine; his look is blank, unreadable. Have I somehow betrayed him in trying to save him? What will happen to him? The procession reaches the far side of the quadrangle. A car is waiting. Runild and two of the senior oracles get into it.

After dinner Steel calls me aside, thanks me for my help, tells me that Runild is to undergo study by experts at an institute far away. His power of mind-contact is so remarkable, says Steel, that it requires prolonged analysis.

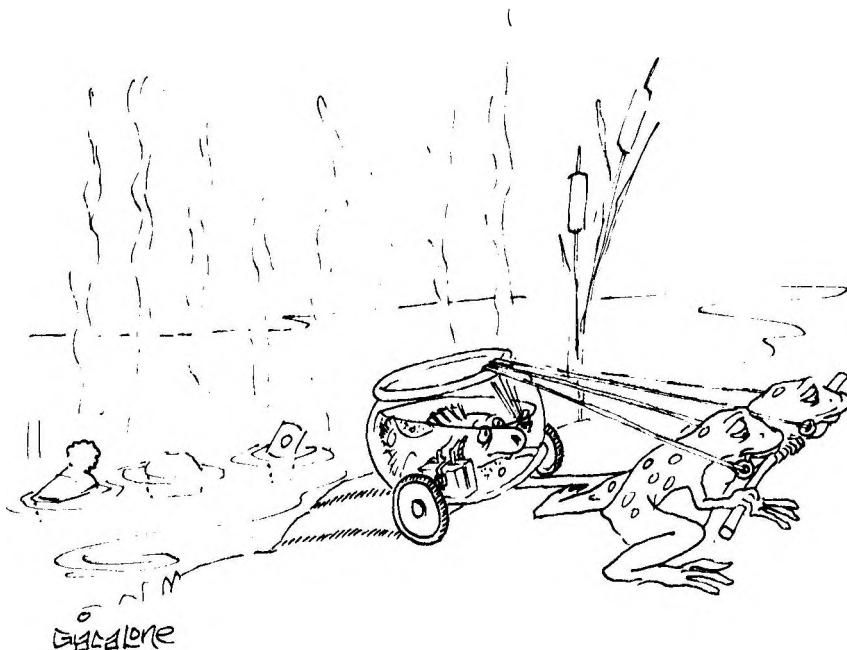
Mildly I ask whether it would not have been better to keep him here, among the surroundings that have become home to him, and let the experts come to the House of Double Minds to examine him. Steel shakes his head. There are many experts, the testing equipment is not portable, the tests will be lengthy.

I wonder if I will ever see Runild again.

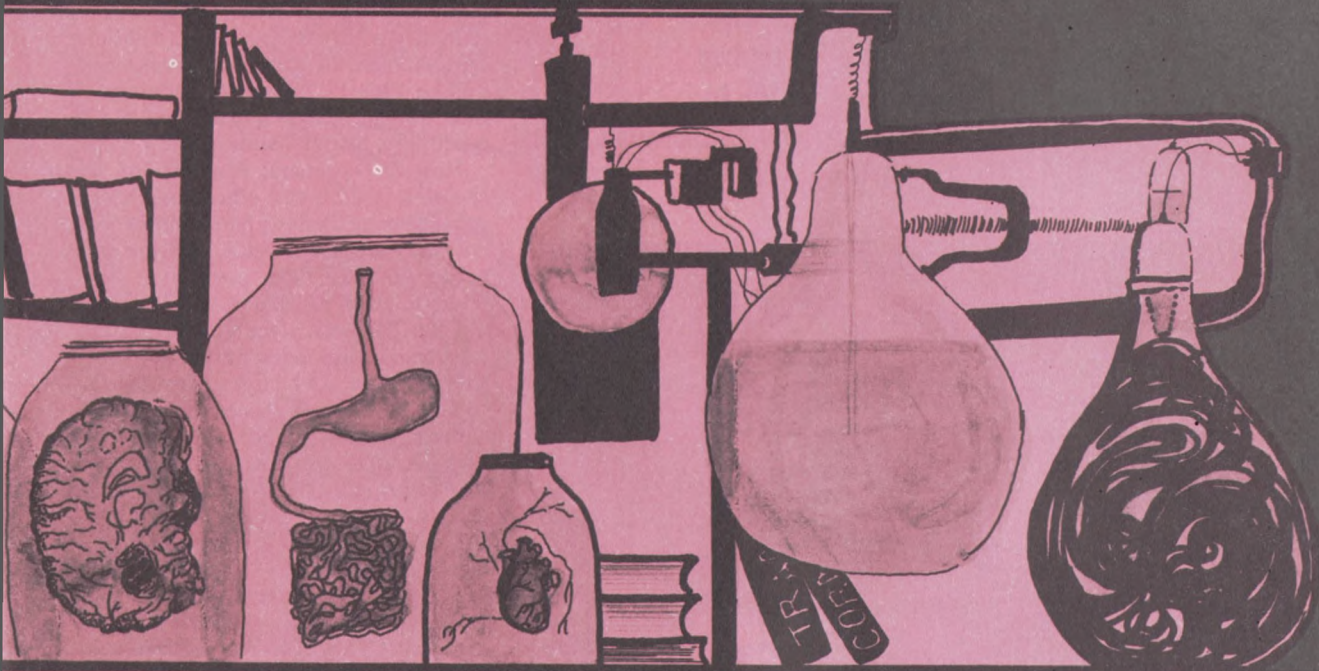
In the morning I meet with my group at the usual time. They have lived here several weeks now, and their early fears are gone from them. Already I see the destinies unfolding: Galaine is fastwitted but shallow. Mulliam and Chith are plodders, Fyme and Hirole and Divvan may have the stuff of oracles, the rest are mediocrities. An average group. Hirole, perhaps, is becoming my favorite. There are no Jens among them, no Runilds.

"Today we start to examine the idea of non-verbal words," I begin. "For example, if we say, Let this green ball stand for the word 'same,' and this blue box stand for the word 'different,' then we can—"

My voice drones on. The children listen placidly. So the training proceeds in the House of Double Minds. Beneath the vault of my skull my dreaming Right throbs a bit, as though reliving its moment of freedom. Through the corridors outside the room the oracles move, deep in contemplation, shrouded in impenetrable wisdom, and we who serve them go obediently about our tasks. ○







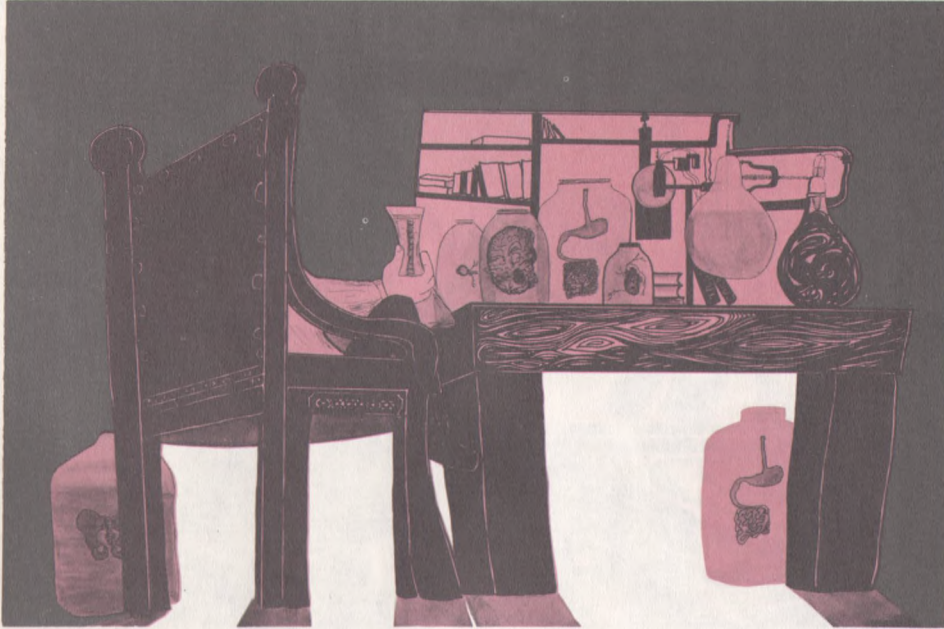
HUMAN BEINGS ARE A NATION'S BEST RESOURCES

fiction/LEONARD TUSHNET
artist/SUSAN JENKINS

He was just a businessman,
doing what was good for
business. Wasn't he?



He had the country in the palm of his hand, but he made the mistake of trying to slip a knife in the country's back with his other hand.



Hotel de la Republica
Tontores, San Cristobal
January 21, 1981

Mr. Raymond Belfair, President
Human Materials Consolidated, Inc.
New York City

Dear Boss:

First of all I want to thank you (so does my wife) for sending us down here away from the snow and ice. The weather is superb and the scenery is incredibly beautiful.

Second, I have already made contact with Sr. Imorales, the President's private secretary. To be perfectly frank, he contacted me. As in most foreign countries we had to turn in our passports to the hotel clerk, who got in touch with the local jefe, who came to inquire as to the purpose of our visit. After he left, Sr. Imorales called me. We are the only tourists in this huge hotel. Most of the rooms are occupied by important people, their wives, so to speak, and village leaders here to seek audience with El

Presidente. Naturally we were regarded with suspicion. Tourism began to decline about twenty years ago when El Presidente was elected, more or less. Police authority is very strict here, as it should be. Otherwise the ignorant citizens might oppose what El Presidente is doing for their own good. This way all is calm and quiet here, like in Ossining, New York.

Now for a general rundown of the situation. Our home office researchers were accurate. Banana plantations could not meet the XXXXXXXX pressure and no longer exist. The population continues to grow. Morbidity and mortality is high. Tontores is the only large city, very grand, with many heroic statues of El Presidente, and large mansions occupied by Cabinet ministers. The Parliament building, since the XXXXX-XXXXXXX of the deputies, is now a museum containing pre-Columbian artifacts. (Some of these are for sale, I was told, in case you want to enlarge your art collection.) The subsistence economy of the countryside is augmented by the national operations of the copper and silver mines but Sr. Imorales tells me that production has fallen off because of the world market. XXXXXX-XX

I have given him the folder describing our company. I also gave him the photo-stats of the newspaper reports from Haiti about the operations of another concern.

I have an appointment to see the local hospital with Sr. Imorales tomorrow.

I believe all will go well.

Yours truly,
Arnold Hammond

**HOMENAJE AL PRESIDENTE!
PASSED BY THE CENSOR.**

Hotel de la Republica
Tontores, San Cristobal
January 24, 1981

Dear Boss:

Good news! Sr. Imorales was impressed by the proposition. Tomorrow I see El Presidente himself.

The hospital can easily be converted for our uses. It is very modern, fully equipped, but empty. Most of the people prefer to go to curanderos. Furthermore, all the doctors and nurses remaining in San Cristobal are under detention in a pleasant sunny place like our Alcatraz in California because they participated in a plot against El Presidente.

The financial arrangements have to be firmed somewhat.

Very truly yours,
Arnold Hammond

HOMENAJE AL PRESIDENTE!

PASSED BY THE CENSOR.

Santa Maria de las Lagrimas
February 1, 1981

Dear Boss:

As you see from the address, we have moved. We are now in the penthouse apartment of the former director of the hospital. The Big Man was very affable. When I said I could not discuss money matters with the home office in a censored letter because of the possibility that the competition might hear of our project, the Big Man agreed to end censorship of my mail.

Please deposit \$20,000 as earnest money to the account of the Big Man in Zurich. Sr. Imorales is sending you the account number by diplomatic courier. That's so nobody in our office will know it. Can't be too careful, Big Man said with a wink at me.

I arranged a meeting with Dr. Alfredo Amirante at the Misericordia prison. He is willing to co-operate with us once he is released. Then I'll see that the other doctors, nurses, and technicians are released. That jail is Hell itself!

The way I figure things now the plasma bank will be set up within two weeks. Fast Work, huh?

Yours,
A. H.

Santa Maria de las Lagrimas
February 20, 1981

Dear Boss:

The first shipment of plasma leaves today. Air-conditioning or not, I've been sweating over this whole deal. You wouldn't believe the trouble I've had here. Everyone with his hand out. The contingency fund is almost depleted. I complained to the Big Shot about the corruption. He got very angry and promised to put a stop to it. He recognizes that a modern business can't make a profit with so much grease.

Imorales was executed by firing squad this morning. Please deposit the sum we agreed on monthly in the Zurich account.

The doctors, nurses, and technicians who agreed to work with us are now all free. On parole, that is, and under surveillance.

The apparatus functions very well. The donors are overjoyed when they get paid. They didn't expect that. The way they're exploited is unbelievable. The jefes bring them here in trucks and they have to pay for their transportation. Then the village chairman gets a piece, and some more goes for the national tax,

plus the surcharge for La Patria—meaning Big Shot. The poor slob ends up with about a quarter of what we pay, and they're thankful for that. We've got nothing to complain about because we pay only half of what that other concern in Haiti pays, so we're getting a good deal. Everybody's happy.

You will be pleased to know that I am on very good terms with The Man. He's pretty sharp. On his own he's gotten in touch with several medical schools in the U.S. and he tells me that they're not too satisfied with the cadavers for dissection being exported from Haiti. Too much fat because of the African tendency to obesity. The Indians here are thin. Why not? You should see what they live on. Big Shot says he could arrange for a steady supply of cadavers, age or sex makes no difference. To forestall any private arrangements on his part, I said we could handle cadavers, too. I don't know what the cost and going price is back home but whatever it is he'll undersell. If you're agreeable, the payment is to be made to the Swiss account.

Yours,
A. H.

Palacio del Presidente, Apt. 4
June 6, 1981

Dear Boss:

Thanks for the bonus, although I must admit I was disappointed. I expected more, to be frank. Don't forget I started from scratch and within the past six months you're making a pile from the plasma and cadaver operations. Since I have to do all the promoting and entertaining here, I thought the bonus should have been, let us say, a real appreciation and not a token of it.

Perhaps you'll add a little more now that the bags of hair have begun to arrive. Just consider what little fun Myrtle and I have down here—no concerts, no ballets, no theaters, no cultural life of any kind. When you've seen one flamenco dance, you've seen them all.

Yours,
Arnold

As you note, I now have a suite in the Presidential Palace, like our White House, but bigger and fancier.

Palacie del Presidente, Apt. 4
September 7, 1981

Dear Ray—

Just a note to report that the cornea removal program is going along fine. You have no idea how greedy Big Shot is. He'd have been willing to let the "volunteers" give the corneas from both

eyes but I said I wouldn't take them. How low can these crooks get?

Yours,
Arnie

Palacio del Presidente, Apt. 4
October 12, 1981

Dear Ray—

Happy Columbus Day! Fireworks, dancing in the streets, general festivity.

El Presidente gave a banquet yesterday in my honor. He made a long speech praising me. The economy has certainly picked up since I'm here and you can see the results: work started on paving the streets and roads, schools going to be opened and irrigation projects started. Village clinics (used also as branches of our company) are already functioning. The infusion of foreign money in exchange for the exports has given the country a real lift. As El Presidente said, "Human beings are a nation's best resources."

Today I was decorated with the Order of St. Vincent. It carries with it all sorts of privileges, like using the National Library free of charge, etc. I'm sending the medal (24 karat gold) back to Washington with our military attaché here. He'll arrange for you to get it. Please see that my sister (her address in on the emergency sheet) gets it so she can put it in a safety deposit box.

El Presidente wants me to remind you that he expects a 10% increase in his monthly honorarium once the new operations get under way.

Yours,
Arnie

Palacio
October 21, 1981

Dear Boss:

I meant no disrespect to the organization when I said that the Pres. praised me. Me, as the representative of HMC is what he meant.

I assure you of my fidelity to the company.

Sincerely,
Arnold Hammond

Palacio del Presidente, Apt. 4
March 6, 1982

Dear Ray—

I don't know what you're crabbing about. I get the Wall Street Journal down here, too, you know, so I read your financial statement—Unless you're lying to the S.E.C.—which I don't think you'd do, being such an upright church-going citizen and also so careful to keep every-

turn to page 82

OCCURRENCE IN A CINCINNATI BOG

from page 39

"Looking for my electricity bill," George said, tossing papers about. Suddenly he turned in his chair and stared at his visitor. "Your territory? I bought this house two years ago." He paused. "Wait a minute, just what are you, anyway, some sort of Jesus freak?"

The tiny man stuck a finger up his nostril. "I'm a troll, you dope. And trolls are very defensive about their property. And this *is* my property."

"Prove it," George challenged.

The troll extended a short, fat arm. "Here's the deed."

George took the creased sheet of paper and glanced it over. "Hey," he said at length. "This *is* the deed to my house. No, wait a minute, I've got my deed sitting around in my desk somewhere."

The troll snorted. "Okay, Buster Brown, show it to me, then."

"I can't. I just remembered I lost it months ago." George looked over the troll's deed more carefully. "Hold on," he said suddenly. "This deed isn't any good. Listen: This deed entitled signer to a bog in Scotland at the following address: 650 Birchwood Street, Cincinnati, Ohio."

"Isn't this a bog in Scotland?" the troll asked uncertainly.

"It doesn't look much like one, does it?"

The troll glanced at George's television set, then at the golf bag propped in the corner, then at the girlie fold-outs on the wall. "No," he said slowly. "I guess not." He made a fist and slammed it into a round palm. "Goddamned land frauds. They'll get you every time." He scratched his crotch and rubbed his pudgy hands together. "Well, I guess I'll just have to make the best of it." He scrambled over to the television, climbed on a chair, and turned the set on.

"Listen," George said. "If you're going to use up juice watching the idiot box, at least help me look for the electricity bill. The company told me that if I didn't pay that bastard by today they'd turn off my power."

"Quiet," the troll said, turning the volume up very high. "I'm watching re-runs of David Susskind."

George leaped from his chair, gesturing wildly. "Goddamnit!" he shouted. "I *hate* David Susskind. He's got a phony smile. Look, if you've got to watch TV, why can't you watch something entertaining? Or at least turn the volume down?"

The troll twisted around, and a green head popped up over the chair back. "Aw, come on, buddy. I've had a tough enough day already without you

screaming about what I want to watch on TV."

"It'll be tougher if you don't turn the volume down right now!" George raged, curling his fingers into fists and advancing toward the troll.

"Okay, okay, don't get punchy. Trolls aren't used to sharing fancy suburban houses with loud, pennypinching kikes."

Listen here, you snot-colored son of a bitch . . ."

"Only kidding," the troll said quickly, turning the volume down.

George strode into the kitchen and made himself a corned beef sandwich.

asked, "What's this bridge business?"

"All trolls have bridges," Theodore said. "So that they can eat anyone who tries to cross them."

"What if nobody tries to cross your bridge? Won't you starve?"

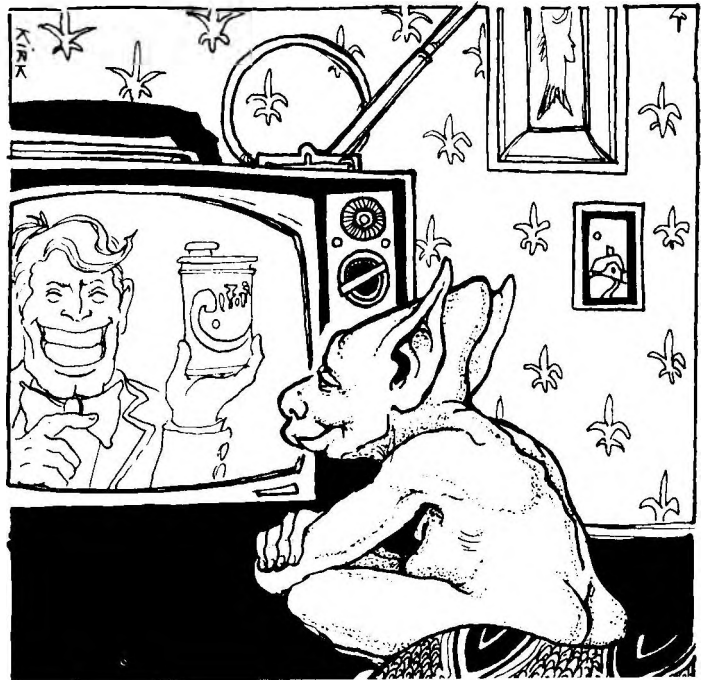
"We also eat Velveeta, bologna, Spam, and HoJo Cola."

"Who's paying for this bridge?"

"I figured you would, since you're trespassing on my property," the troll said.

George carefully placed his half-eaten sandwich on top of a pile of papers. "Get out."

The troll extended his middle finger. "No dice baby. You throw me out, I'll come right in through the wastebasket again. It's a space warp, you know."



Trolls are very defensive about their property, especially when the property includes a free TV set.

When he re-entered the living room, he found the troll standing on a hassock, dialing a number on the telephone.

"Hey, no long distance calls," George said. "I haven't paid my phone bill either."

"Hello?" the troll said into the receiver. "Commonwealth Construction? This is Theodore Guiccone, 650 Birchwood Street. Send a crew over here immediately. I want a bridge built in my back yard." He paused. "What? Biggest one that'll fit. Yeah, thanks. Bye." He hung up.

Munching on his sandwich, George

"DO YOU HAVE ROACHES?" came a sudden nasal voice from the television, at twice the normal volume. Theodore jumped several feet in the air, landed on his pointed head, got to his feet. "Nuts," he said. "I *hate* commercials." On the television screen, several large roaches crawled about in a dirty sink. "Bleah. I think I'm going to puke." He ran to the television and changed channels.

"DO YOU HAVE HEMMORRHOIDS?" the television shouted.

The telephone rang. "I'll get it!" Theodore shouted, scrambling over the

furniture to get to the phone. He picked up the receiver, listened for a moment. A shocked expression came over his fat face and he slammed the receiver down into its cradle. "Unbelievable," he said, wagging his head. "An obscene phone call."

"I get at least three of them a day," George said.

"DO YOU HAVE CONSTIPATION?" the television set asked.

"How do you live in this place?" Theodore asked, running to the television once more and turning it off.

"If you don't like it, you can leave," George said.

"No chance," Theodore said.

There was a knock at the door. George strode lazily to it and pulled it open.

"Georgie!" exclaimed a nasal, heavily-accented voice. "How are you, baby?" A heavy, elderly woman with her hair in curlers stormed in, grabbed George, and kissed him soundly on the cheek.

"Fine, Ma," George said without enthusiasm, breaking away from her.

"Who is this nit?" Theodore complained.

"My mother," George said, closing the door.

"Oh, how darling!" Mrs. Berger said, rushing over to Theodore and hoisting him in her thick arms. She turned to George. "Where did you get him? He's the cutest little *shvartze* I ever saw!"

Theodore struggled in her grip. "Come on, lady, put me down."

"So sweet," Mrs. Berger cooed, squeezing him.

"Talk to her," Theodore said plaintively to George. "She's your mother. Get her to let go of me."

Mrs. Berger said to her son. "So, Georgie, you can't take the time to call your mother once in a while? I have feelings, too, you know."

"For God's sake!" Theodore screamed frantically. "Get your hands off me!"

"Oh, you're so cute I could eat you up!" George's mother bubbled. Overcome with motherly emotion, she held Theodore up to her face and nibbled at his buttock.

The troll burst into hysterical tears. "My God, she's biting my ass!" he yelled, his voice growing higher in pitch. With a supreme effort, he managed to squirm out of her hands. He fell to the floor, bouncing on his head and stomach. "Keep your screwy house!" he yelled to George. He ran to the wastebasket and jumped in.

George walked to the wastebasket, peered inside. It was empty save for a small piece of paper. He picked it up and peered at it.

It was his electricity bill.

At that moment, the lights went out.

KI

from page 51

His hand flicked. The gun flew off to the side—and struck the lifting weapon of another guard. Both guns dropped to the floor.

With an incoherent scream, Garcia jumped at Hiroshi, his hands stiffened for deadly blows. That was his mistake. No man who knew Hiroshi would have tried such an attack.

The little *sensei* caught one arm, lifted it, and hit under Garcia's armpit with his thumb. Then he applied a submission lock on the man's arm.

Garcia screamed with pain. Guns, coins and watches flew up all over the room, but Hiroshi's *ki* was spread out in a thin interference pattern that prevented accurate attack from that quarter. He held the grip.

All fight left the would-be king of the world. "You *are* a clear!" he muttered brokenly.

"Merely proper discipline," Hiroshi said modestly, maintaining the grip.

In a moment a crowd formed about them. "Congratulations!" the President of the General Assembly exclaimed, an interpreter standing beside him and rendering it into English almost simultaneously. "You subdued the madman!"

Hiroshi shook his head. "Not mad, merely misunderstood. He has no power over metal. Only over people. He did not realize that himself, or he would have had far more power than he showed. Still, it is a wonderful *ki* he employs, deserving of scrupulous study. I shall see that this occurs."

"We'll throw the book at him!" a guard cried! "Making us shoot up the assembly hall—"

But the Cuban and Japanese delegates interceded, Communist and Capitalist standing shoulder to shoulder on this issue. "This man deserves whatever reward he asks," the Cuban said. "He saved our lives!"

"He is Hiroshi, the world's leading aikido *sensei*," the Japanese said. "No lesser man could have stopped Garcia—and no police can control Garcia now. Let Hiroshi take this man wherever he wishes; what jail could hold him?"

No one could argue with that. "It was I who borrowed your visitor's pass," Hiroshi confessed to the Cuban. "I regret the necessity, and fear the information girl will be blamed—"

"I shall demand her promotion!" the man said earnestly. "That madman's plan was full of holes. He could never have been king of the world—but he could have killed many of us and complicated the international situation perilously, if you hadn't been here!"

There was the clamor of babel as

everyone tried to question and congratulate simultaneously in scores of languages. The President was trying to re-establish order, futilely. In the confusion, Hiroshi escaped with his charge.

The trip to Japan was simplified by the complete cooperation of governments and airlines, but complicated by Hiroshi's need to maintain surveillance over Garcia. If the man ever realized the extent of his power and used it effectively, he would never again be confined. Only one place was secure—and that was where Garcia had been destined from the moment Hiroshi responded to the message of *ki*, could he have known.

They went to the Japanese Isle of Hokkaido, into chill mountainous wilds. Fierce Ninjitsu warriors watched—but recognized Hiroshi, and did not challenge him.

Inside an ancient castle, in a bleak bare chamber, a long-bearded, emaciated man of about ninety sat cross-legged. The eyes were shrunken and sightless, the ears deaf, the movements so slow as to suggest idiocy, and an odor of putrefaction rose from the shriveled body.

Hiroshi bowed. "*O-Sensei* Fu Antos, I have answered your call," he said with unfeigned respect, though his action and words were superfluous. "Here is a talent for study."

Ki reached out from the ancient—far more powerful than Hiroshi's own. Garcia stiffened and looked about, frightened—and the pressure of his containment eased. The blind dumb head inclined. The talent was worthy.

Hiroshi bowed again and backed away, alone. The relief was vast. What would he have done, had Fu Antos not acceded? Now his mission was done.

A day later, still exhausted, he returned to his *dojo*. His students crowded about, forgetting themselves in their eagerness to learn of his adventures. They were powerful athletes and ranking practitioners of the martial arts, but before him they were like children.

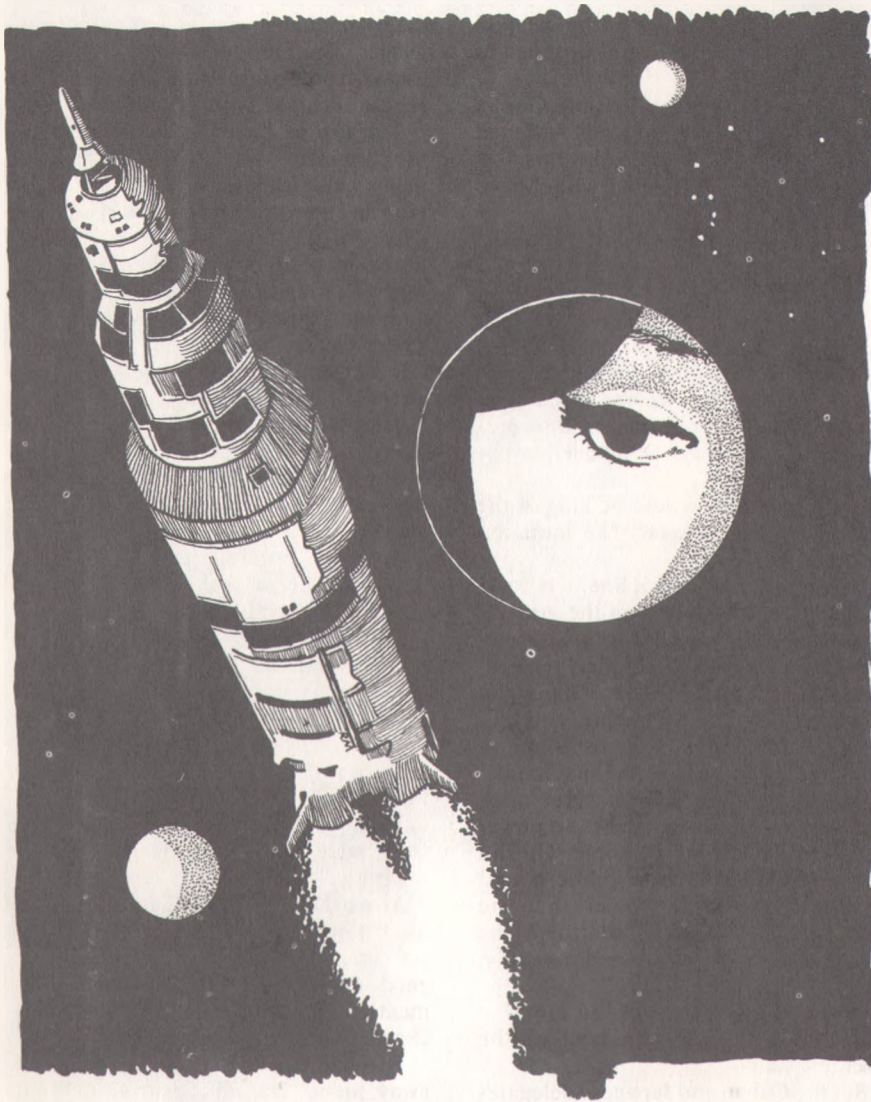
"A few necessary errands," was all the weary *sensei* would say as he sat on the floor in his accustomed spot.

One student held a newspaper whose headline screamed of New York and paranormal talents. He looked at Hiroshi and shook his head, resigned. Would any student ever master even a tiny fraction of the spirit and power and humility this wizened little mystic possessed? What was *ki*, after all?

It was a question Hiroshi himself longed to have answered. *Clap two hands*, he thought, *and there is sound* . . .

THE SEEDLINGS

from page 27



choked to death on her own poisons.”

He ran a hand through his white hair. “Of the hundreds of couples permitted to apply and the dozens who began the course, you are the only ones who completed it. You are the best. Can you possibly begin to conceive the debt you owe and are owed?”

Grayson walked to the wall-sized screen at the rear of the room and flicked a switch. A colored vista of green hills, blue sky and crystal water appeared. He tapped it gently with a pointer.

“This, ladies and gentlemen, is Eden—and well-named. Each couple here is Adam and Eve. You are also Confucius, Sappho, Christ, Shakespeare, Lincoln and Handel. You have the culture and knowledge of 30 centuries and the opportunity to perpetuate humanity on a world that was like ours; at the dawn of time—a world that through some phenomenal freak of nature or boon of God

Man’s new home was to have none of the problems of Earth, so it was only natural that the new home should be peopled with only the best.

has the same atmosphere and physical properties of our own.”

He flicked the switch again and the 12 pairs of eyes reluctantly left the fading picture to return to him.

“Earth has 50, perhaps 75, years left.

We can not dispel the poisons we have spent centuries creating, but we can keep our race alive through you.”

A noticeable quiver crept into his voice. “You are the founding fathers of a new world, but I think of you as seedlings. You are all the generations of Man. We have been able to gauge your intelligence and your capabilities but there is no way to plumb your secret hearts. I fervently hope—I pray—that each of you is worthy of this trust.”

Tears brimmed over his eyes and ran unchecked down his cheeks. “Forgive me; an old man’s weakness. My grandson and his wife were accepted for the course. They failed in Phase Seven.” He held up his hand to quiet the murmur of sympathy. “Please, no. I would have only the best carry the burden, only the best.” He turned and walked slowly from the room.

George Hallon awoke with a start that night to see his wife peering through the half-open door into the hallway. “Marie, what is it?” She gestured to him and he strode to the door.

Mr. Li was pleading with Professor Grayson in his Oxford-accented English. “But I assure you, Professor, Victoria—Mrs. Li—has had this type of attack before after deep emotion. The fever will pass in a day—two at the most.”

Louis Valade and Hendrik Heckman were trying to intercede for him but Grayson shook his head. “The answer is ‘no.’ I am sorry, Mr. Li, but I can not risk sending an illness to Eden. You and your wife will be provided with transportation back to your home after the ship leaves tomorrow.” He turned and walked down the hall. Valade and Heckman lingered for a moment but Li stared blankly at the floor like a condemned man.

Marie Hallon gently closed the door and turned to her husband with moist eyes. “Oh, George, isn’t it terrible?”

“It’s a bad break for them all right,” he said as they settled into their bed. “But if it had to happen to anyone, better them.”

“What do you mean?”

“I wouldn’t have said anything but I couldn’t get comfortable with the idea that some grandchild of mine might have been slant-eyed.”

“Well, I think it’s a shame.”

“Yeah, Honey; better get some sleep now. We blast off in six hours.”

They soon slept. Outside, the ship stood in the moonlight with its cone pointed heavenward, toward Eden and Man’s new and eternal home. ○

BLOODSTREAM

from page 7

I'd come at the right time, and banged again. Still nothing. I began to feel like a fool.

On the point of giving up and going away, however, I heard my name called and turned to find Bill approaching from the corner of the street, a quart bottle of beer in each hand. I greeted him nervously, unsure after this morning whether I might not be dealing with an out-and-out lunatic. His half-apology for making me wait left me still in doubt.

"Sorry, I don't usually keep drinks in the house. So I went to buy some. We'll have to get rid of the liquor laws, you know—they're too flaming regular. Well, come in!"

He thrust a key into the lock and swung the door back to reveal that the interior was as bad as the facade: peeling wallpaper, dirty brown paintwork, an unshaded light-bulb swinging above the hallway in the draught from the door. I couldn't contain myself any longer.

"In heaven's name!" I burst out. "What possessed you to pick an area like this?"

"It was the biggest house I could buy with what father left me," he grunted. "Fourteen rooms not counting the basement. This way."

He led me into a room at the far end of the hallway, and I found an incredible shambles surrounding an incongruous island of neatness, newness and order. Most of the walls were shelved as high as he or I could reach, but the shelves didn't afford enough space for all the clutter he'd accumulated. In heaps and mounds and piles, on every piece of furniture and practically the entire floor, there were books, magazines, cuttings from newspapers untidily clipped together, maps, photographs, dirty china plates, chipped tea-mugs with foul sugary messes dried on the bottom.

But in the very center of the large room there stood a new modern desk, its shiny teak top thick with dust except where it had been brushed clean by accident, bearing a whole range of office equipment: an electric typewriter, a dictaphone and a tape-recorder as well, beanstalk lettertrays, a microfilm viewer, a Rotadex card-file, a Britannica year-book for the previous year in a glossily expensive leather binding—all as though the heart of some Mayfair executive's sanctum had been transplanted to this horrible West London slum.

He rummaged in a cupboard, which he could barely force open past a stack of newspapers that had tipped askew to rest on the corner of its door, and found a couple of glasses. They were at least clean; the cupboard must be moderately



**What replaces man
may well do the
replacing without
bothering to ask
permission, or
even bothering to
give notice that
man is to be
replaced.**

dust-tight. Handing beer to me, he gave a crooked grin.

"You look shocked, Chris! I suppose you would be. You *believe* in urban renewal, don't you? Slum clearance? New Towns, redeployment of industry, housing estates, monorails and hydro-foils and all that stuff?"

His tone was deliberately jeering, and I rose to the bait. "If you *want* to live like an animal, I can't prevent you, but I'm damned certain if you ask your neighbours whether they approve of the work I'm doing you'll get a resounding yes from them! For heaven's sake, Bill, why *are* you pigging it in this filthy hole? Are you out of a job?"

"I don't work for anyone but myself, if that's what you mean. I did try it for a while, but somehow I and my bosses never hit it off. I got sacked every time. I called it the Brush discharge effect. Sorry, I forgot—you were reading political economy, weren't you? Wouldn't get a scientific pun. Here, sit down."

He cleared us a couple of creaky arm-chairs, stacking their burdens of paper one atop the other on a patch of floor

that had previously been vacant, and cradled his beer-glass in both hands in a pose so characteristic he might have been back in the Junior Common Room of his college arguing some academic point over sherry and biscuits. The contrast between Brush-then and Brush-now dismayed me so much I forgot both tact and my intention not to annoy him for fear of provoking violence.

"Bill, are you out of your mind? Living here—wanting people to call on you in the middle of the night—refusing to have a phone because it's 'dangerous'—*what the hell is going on?*"

"Quite a lot," he answered, unruffled. "I'm not idle, if that's what you're implying. I've been working on this—in fact, I still am, because I found I'd left all kinds of important points out of the first draft. Take a look." He reached at full stretch and withdrew from among a heap of tattered scientific journals a bound typescript in a blue cover which he tossed into my lap.

From the handwritten label pasted to the front, I read aloud: "*The Organization of the Urban Entity*—hmmm! Sounds as if you've moved into my field!"

"Not exactly. Open it."

I did so, and found myself confronted with page after page of densely packed formulae and equations, many of them with pencilled addenda.

"Means nothing to me, I'm afraid." I admitted.

"It's a study of the biology of London," he said.

After a long silence I shook my head. "I don't get you," I muttered.

"That doesn't make you unique. Still, I'll try and make it clear—it's got to get through at the very least to people like you if it's to have any effect. Though why I worry about it having an effect, I don't know. It'll be about on a par with trying to explain to a bunch of red corpuscles why they shouldn't clot *here* because that'll cause a cerebral thrombosis. They'd laugh in your face, wouldn't they? And go right ahead, clotting!"

I stared at him, wondering when, if ever, he'd start to make sense.

"Sorry. I sometimes think of this as my corpuscular theory, but you wouldn't get that reference, either . . . Try it this way, then. Chris, define a living organism."

Struggling to think clearly, I countered, "Can it be done? I thought even biologists weren't down to a hard-and-fast dividing line."

"True," he agreed with a nod of ap-

proval which I found unbearably patronising. "But you can get some parameters. A living thing is capable of drawing into its structure raw materials from its environment—some crude, some previously processed by other organisms—and turning them into part of itself. Right? Good! But crystals also grow by accretion of material from their environment, so that's not the whole story, obviously. No, the specific ability a living organism possesses consists in the faculty of imposing patterns on the exchange of energy between itself and its surroundings. Do you follow me?"

This sounded more like the old Bill Brush! I said encouragingly, "Can you give me an example?"

He rubbed his unshaven chin. "Well, consider the course that evolution has taken. Hypothetically, you start with some irrecoverable ultra-simple organic entity which just floats around soaking up what it bumps into, yes?"

"An amoeba?" I hazarded.

"Christ, no—that's already a pretty highly organised beastie! It's several stages past the starting-point. I mean, it can actually reach out to engulf its food—wrap around and absorb it. But it'll do for the next stage of the argument, because instead of just drifting it moves towards the food. And you progress from there to many cells working in collaboration instead of a single cell on its own, you see? After that you segment, so you can repeat one pattern several times and build up a large creature—a worm, say. And of course you develop specialised organs. And then bilateral symmetry, so you have a left half and a right half, and grow legs on them to move you around faster. Eventually you start taking in your raw materials in a more thoroughly processed form: you eat vegetation. And then you eat what's eaten vegetation, and become carnivorous. So at every stage of evolution progress is marked by your increasing ability to impose your pattern—the identity of your species—on raw materials from farther and farther afield. Are you with me?"

I was frowning, but I'd at least absorbed the gist of what he was saying.

"I think so. You mean we're very highly evolved ourselves because—well, for example, you can sit here in London and eat a banana from the West Indies, and get nourishment from it?"

"It's not an image I'd thought of, but it'll do nicely. Does anything else follow from the idea?"

"Ah . . . Well, I suppose in human beings it doesn't apply only to food.

After all, we impose designs we invent in our imaginations on all sorts of things: wood, stone, metal, plastic . . ."

"Bravo," he said ironically. "I seem to have made you understand at least half the truth. I must be getting better with practice—I've had to try and explain this to at least fifty people by now. Let's have a shot at the rest of it, then. Chris, what's information?"

"Do you mean in the technical sense?"

"The most technical possible. It too is the imposition of a pattern—to be strictly accurate, I should say 'recoverable information'. I speak, you sense a rhythmical pattern of sound-waves, and from it you decipher my approximate meaning. An iron-foundry is far noisier but because the sound is disorganised it carries practically no information except that things are going crash and bang somewhere. Okay? Good! Now consider these complex living organisms we've been talking about. Their ability to cope with the world depends on the transfer of information—patterns—from one part of their bodies to another, right? Consider yourself this moment. You know where your feet are, whether you're warm or cold, whether you're sick or well, whether you're hungry or satisfied. And you couldn't exist without such knowledge. You've heard of these experiments they've done in sensory deprivation?"

"Where they lock people up in lightless and soundless rooms?"

"Exactly. Now these experiments prove that deprived of sensory data you lose the coherent structure of your identity. Bears out my point, doesn't it?"

If I'd known exactly what the point was, I could have agreed honestly; as it was, I nodded and pretended.

"Now," Bill pursued, "how does this information get around?"

"Along the nerves, presumably."

"Some of it, yes. But nerves are a relatively late invention and carry only the most sophisticated information. You organise your day-to-day existence on nervous data, but when it comes to something really revolutionary—for instance, reaching sexual maturity—the information is transmitted chemically, by hormones. So we can say that a complex organism needs a circulation, a *blood-stream*, to carry the body's most fundamental messages, as well as distributing oxygen and nourishing the cells.

"And, of course, sometimes things go wrong. As I mentioned just now, the red cells may clot together in the wrong place, and don't give a hoot that they're doing so in the brain of—of a Prime

The ORGANIZATION Of the URBAN ENTITY



**It may not be homo superior
who replaces man. Homo may
not play any part in the
future of our world at
all, though he may not
even realize his time
has passed.**

Minister! Some more beer?"

I was much more relaxed by this time. I held out my glass.

"And this—this thesis you've been working on is a fuller explanation of what you've been saying?" I suggested, tapping the typescript on my lap. He nodded, and I went on. "Well, I can see how you might draw analogies between a living creature and a city, but it seems like rather a fanciful concept to involve you in—what?—years of work!"

"Nearly ten years. Since just after I last met you, I suppose. But hang on one more minute before you start putting me down. Did you ever speculate on *homo superior*, or what might be the evolutionary successor of man?"

"Not very often." I shrugged. "From what I can gather, he's unlikely to show up yet awhile. We've cut ourselves loose from Darwin's process of natural selection by inventing medicine and—What's wrong?"

He was scowling. All my fears, which had receded because this discussion reminded me so much of the long enjoyable bull-sessions we'd shared at university, returned on the instant. In a tone of sharp contempt he said, "Don't tell me you believe this rubbish about our having escaped from the pressure of our environment by creating the technological society!"

"Ah . . . Why not?" I tried to conceal the fact that I was measuring the distance to the door with my eyes.

"Because it isn't true! All we've done is build an artificial environment which imprisons us much more efficiently than the natural one! It's not the first time that a new development in evolution has—what could you call it?—*fossilised* an earlier stage inside itself. Haldane proved, years ago, that the constitution of a man's bloodstream corresponds almost exactly to the saltiness of the sea at the time when our first land-going ancestors crawled out of the water."

Dazed, I shook my head. "You seem to have lost me somewhere," I confessed. "I can't argue with you about these technical points, but—well, what's this got to do with *homo superior*?"

"I should have known," he said disgustedly. "Like trying to tell a corpuscle bent on clotting 'you can't do that there 'ere!'" He drained his glass of beer and reached to refill it.

"Look, Chris!" he went on, when he had recovered his patience. "The whole point is that it's not *homo superior* which constitutes the next stage after man. *Homo* doesn't enter into it, except as a minor element of a larger whole. Hell,

you've got a description of your successor right there in your lap!"

I glanced down feebly. I said, "A—a city?"

"Yes. Of course. Why not?"

I was bouncing back and forth inside my head like a ping-pong ball. This morning I'd been afraid Bill was crazy. Tonight he'd talked so convincingly I'd decided I must be wrong, and he was nothing worse than eccentric. Now, here, all of a sudden, he'd toppled over into what sounded like out-and-out fantasy. I wished to goodness I could simply get up and walk away.

Before I could say anything else, he had pressed on in a loud, authoritarian voice.

"Chris, don't bother to voice objections to my idea—I've heard them all, and they don't hold water. Most likely you'll begin by saying a city can't be organic because it's made of brick and stone and concrete and glass and steel. I rebut that. What's organic about the calcium compounds you wear in your skeleton, once the muscles and marrow have rotted away? And the city takes raw material from all over the world and imposes pattern on it, you can't deny that! Right this minute I bet you could find people of fifty different nationalities in London, and all of them are having to comply with what the city dictates: the buses and trains they ride, the food that's available in the shops, the clothes, the cars and taxis, the machines inside and outside the homes . . . You can't take a car where a road doesn't run, you can't catch a bus when they're all parked in the depot!

"What's more, the city transmits a phenomenal amount of information from one part of itself to another, just as we do ourselves, and it excels us in a crucial respect: it exchanges information with others of its kind on a scale no human being could ever hope to match. Why the hell do you think I was at the Shoot-up Hill phone exchange this morning? I was collecting figures on the number of calls made during a working day. If you hadn't turned up this evening I'd be busy graphing them against the number of nerve-impulses transmitted in a human body at various times of the day and night. I've already correlated enough data to show that the city operates a whole order of magnitude above us humans, but it's not enough to suspect the truth—you have to document it. And another thing. Where do you live?"

"I told you this morning: Mill Hill."

"And your office is in the West End. So you commute. So it can hardly have escaped your notice that the city has a circulatory rhythm, with an actual systole-diastole during the morning and evening rush-hours? And it's subject to attacks of high blood-pressure, when Christmas shopping or the summer sales attract above-average crowds?"

I made to frame an objection, but he plunged on.

"What's more, this continual flow of traffic from the vitals to the extremities and back fulfils all the requirements of a circulation. It carries nutriment in trucks and goods wagons, it carries hormone-effectors in the shape of people, and it carries hormone-instructors in the shape of mail and newspapers. Don't argue. Just open your mind and think."

I sat there, trying to pluck up the courage to make a dash for the door.

"Oh, come on, Chris!" Bill rapped. "You of all people ought to see the truth of what I'm saying. After all, aren't you performing the one function of a living organism which so far we haven't touched on? You're involved in founding new towns, aren't you?"

"Of course I am!" I forced out.

"And you know there are dead cities, surely—Mistras, in Greece; Mohenjo-Daro; Camelodunum, come to that, close to home! So you must concede that cities can die?"

"Well . . ."

"And if they can die, presumably they must also be born? Hell's bells, Chris, you spend your time bringing that about! You're a gonad, damn it—you're helping London to breed!"

A great grey fog seemed to settle over my mind. My reluctance to believe my better judgment vanished. I could no longer doubt that William Brush, once a brilliantly promising scientist, had turned into Bill Brush, recluse and crank. Of course, I'd have to do what I could for him—perhaps his late father hadn't been his only relative, so I must try and trace others, and get in touch with his former college so he could be helped . . . But I wouldn't dare become more closely involved myself, not with a wife and two infant sons.

I hoped desperately that, after I'd managed to get away from here, he wouldn't think of looking me up in the phone directory and coming to plague me at home—or worse still, at the office, giving my superiors the impression that I was a convert to his crazy notions.

But *how* to get away? It seemed wisest to work my way towards a feigned ac-

ceptance of his fantasy, since he might not otherwise let me go. So I said, "This is all very ingenious, Bill! But does it tie up with the other things you've said to me today? You said something about pub opening times, for example—does that have anything to do with it?"

"Well, of course." Watching me guardedly, he helped himself to more beer without offering the bottle. "Functions like social drinking are probably essential to our psychological health. You can culture human liver cells *in vitro* in the lab, but deprived of the total environment of the intact organ they lose their power to operate as a liver. The same most likely holds for us within a city. So we can't give up things which we—well, which we enjoy. But we ought to distribute them much more randomly, so they don't interfere with the twice-daily urban pulse."

Everything was becoming clear to me now. Having constructed this elaborate vision of London as a living creature whose corpuscles were cars and whose nerves were telephone-wires, he had inevitably drifted into just the condition I'd expected—paranoia. Presumably the reason for not having a phone must be that he feared carelessly mentioning his "discovery" over the line and being killed for it by the enraged monster striving to keep its secret intact!

"Yes, it all hangs together," I said heartily. "It's very clever of you to have stumbled on this, Bill! Though I must say it's a bit much to digest all at one go. I'd like to think about it for a while and see if I can get it straight in my mind." I drained my glass and set it aside. "Of course, it'll bring about such a revolution in human attitudes when you publish your conclusions . . . Well, I'll find myself out of a job to start with, won't I?"

He stared at me strangely. "What *are* you talking about?"

"I—"

"Haven't you been listening? I told you, we needn't expect to change significantly from now on, not in any respect, any more than the level of dissolved salts in our bloodstream has changed since our ancestors crawled ashore."

"Yes, but surely, once people have been told—"

"They will be, they will be! And I'll have such a mass of proof by then that no one could doubt the truth of what I'm saying."

"In that case, surely people will decide to abolish these cities that have turned into super-beings, and—"

"But that's exactly what I've got to stop

them doing!" he flared. "Right now, what with our traffic-jams and our riots and our stupid little wars, we're no better than a bunch of cancer-cells. You bloody idiot, I'm not trying to tell people the facts so that they'll fight the city—they do far too much of that already. I want to wake them up so they'll cooperate!"

"But—"

"It's an order of consciousness as far above ours as ours is above the bacteria. Isn't it wonderful to be part of that—to know one is contributing, no matter in how small a way . . . ?"

And at that point I completely lost my patience. I jumped up and headed for the door. My hand on the knob, I swung around and snapped, "Not to me, Bill! I want to live my own life, not be one negligible cell among millions in a superbeast!"

"But that's what you are," he said, not making a move to prevent me leaving. "It simply can't be helped."

"Stuff!" I said, and turned the handle.

The door stayed shut. I hadn't noticed a key in the lock when I came in, and anyway the jamb was so cracked and rotten I'd half expected to be able to tear it down. But locked it was, solid as a rock against my frantic tugging.

"Don't waste your energy, Chris." Bill said softly. "It's held shut with an electromagnet, switched from here on my desk. I had it fitted to keep people out when I'm trying to work."

"Let me go, damn you, and you can get on with your, crazy work to your heart's content!" I rounded on him, panting, feeling a chill of terror curdle my guts.

He shook his head. "Not just now. You'll have to wait. Wait until after midnight, at least, when the post-theatre crowds and the nightshift workers are off the streets. I told you: we must each do what little we can to promote the healthy functioning of the city. One day, perhaps, we'll get rid of all these irregular sub-peaks in the city's circulation. In the meantime we can at least reduce the

stress they cause to a minimum."

"You haven't any right to hold me prisoner here!"

"Prisoner?" he echoed sarcastically. "What a way to talk to an old friend you haven't seen in ten years! Want to go away and 'lead your own life', it that it? Bunkum! How much of a chance do you get to lead your own life—two weeks a year, three possibly, when they turn you loose from office hours and appointment schedules? With two kids I'll bet you don't get much spare time at evenings and weekends! Oh, stop fooling yourself! I didn't make you a prisoner. I'm just the guy who wriggled through the bars and stepped outside. Until I turned up, you hadn't even noticed the bars were there."

Choking on my fury, my nails digging deep into my palms, I took what I meant to be a menacing stride towards him in the hope of forcing him to let me go. My foot found one of the scattered heaps of magazines all over the floor; one layer of slick paper slid across another, and I lost my balance and went ridiculously sprawling.

Bill didn't bother to help me up. He simply laughed, turning to pick up the open beer-bottle and pour himself some more.

"That's right, Chris," he said mockingly. "Make yourself comfortable! Relax, doze if you like—I don't care. It'll be all right for you to leave in an hour or two."

Overhead, while I'd been talking, there had been continual noise: first Roland, the younger boy, whining for his mother, then Dinah answering and telling him to shut up, then a bad-tempered wailing which forced her to get up and tramp along the landing to see to him, then the older boy Jeremy complaining that he'd been woken up too . . .

Dinah was going to be unbearable at breakfast, that was definite: by now it was nearly three a.m. But at least the racket had finally died away.

Tapping his front teeth with the pencil he'd been using to make notes as I talked, the policeman gave a nod.

"So at about what time was it you found he'd locked you in, Mr. Hill? Ten o'clock, perhaps?"

"I don't know," I muttered. "Maybe half past. I wasn't in any mood to look at my watch."

"But if he'd threatened to keep you there for another hour or two, until midnight, surely you'd have been extremely

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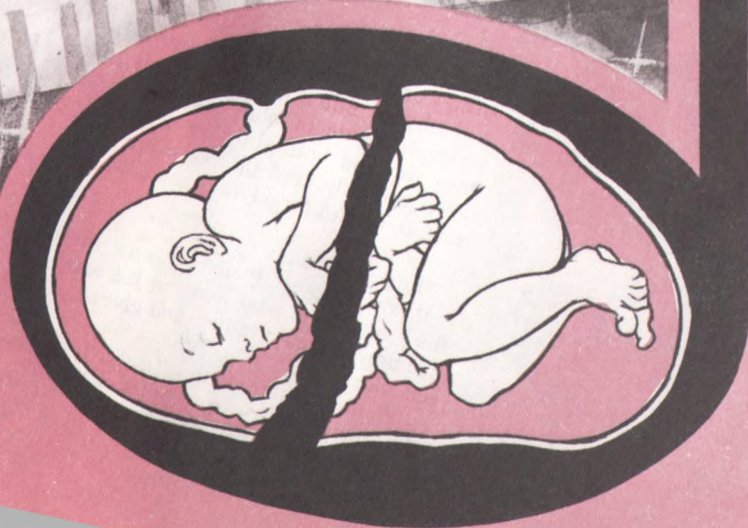


G. Barr

SIXTEEN AND VANILLA

fiction/Ted White
artist/George Barr

She was young and
sweet and innocent,
unready for what he
had to offer. Or
was she? After all,
not everything was
what it seemed.



There was a knock at the door, and I cursed at the damned stirrups. "A minute," I said. Another knock; stronger. "Just a minute!" Then I had my feet nestled in, and I could settle my weight and hook my fingers in the controls. I zipped up the suit front, turned to give myself the usual once-over in the mirror, nodded at myself, and went to the door.

I'm not a good-looking man. My head is too big, my face puffy and overweight in appearance. My eyebrows are a solid line of dirty brown, and my hair looks

"Didn't mean to bug you, Earl," he said. Because he's so nervous, he spits everything out in belligerent tones. It always scares him when I smile at him.

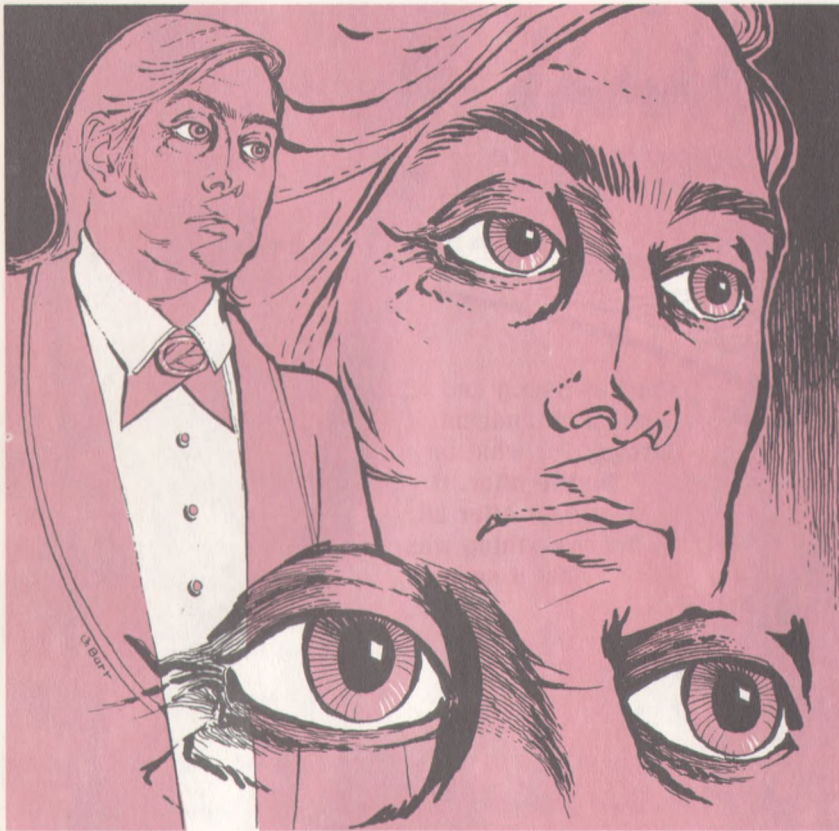
"I'm ready now," I said.

"Need any help?"

I smiled at him again. "Thanks, Paul," I said. "I'm okay."

Sweat was turning his turtleneck brown.

The performance was a standard one. A midwestern town, a capacity audience, but you always feel they're there more from a sense of obligation than anything else. A full house, but polite applause.



She was looking for something new, something exciting, and she thought she would find it in him, while he was looking for something much older, more basic.

stringy and unwashed five minutes after a shampoo. But my eyes are that improbable shade of blue that can lock onto you and hold you like a pinned-down butterfly, and they've done it to me too, when I forget and look too long into a mirror.

"Earl, you ready to go on?"

It was Dubrey. Paul is one of those fussy managers who looks at his watch five times in ten minutes, and gives himself ulcers.

"Plenty of time, Paul," I said. I gave him one of my warm smiles, and my guileless baby-blues.

I gave them a set: Mozart for openers, to make them feel at home; then a little Satie, Carter, and finally a piece of my own that's all tone-clusters and bravura. No encores. The Steinway was out of tune by then, and the house was humid. Polite applause, the standard bow, and then off. Another one-nighter done and finished. Culture for the masses.

When I got back to my dressing room, I found the usual half-dozen civic leaders and the like standing around nervously to shake my hand, and someone had arranged a flora display in front of the mirror where it looked twice as big.

Paul handled things well; it's part of his job to do that. I smiled warmly and sweetly and let my hands be taken and given damp little squeezes, and finally the room was empty but for Paul and a girl.

"I'll be okay, Paul," I said.

He gave me a nervous look and then said something about speaking to the stage manager. He shut the door behind him.

She was younger looking than usual, and her expression wasn't just right. "Oh," she said, when the door closed. "Oh . . ."

I moved over to the mirror and shifted the flowers to the floor. I like to see into the mirror. "Sit down, why don't you?" I suggested. "Relax. First time?"

"What?" she said. "Oh, no—I mean, yes. You, ah, you play very well. I've heard your records before, but . . ." Her voice straggled off nervously like she had lost the thread of whatever it was she wanted to say.

I touched her arm lightly. She gave a start, breath suddenly drawn in, very theatrical: very nice.

"Go on, sit down," I said. The couch was behind her. "Drink?"

"I, well, I . . . I really shouldn't cause you any trouble . . ." she said, stumbling over herself.

I pulled the bottles out of the side drawer of the dressingroom table, and glanced at her in the mirror. The light in the room was bright, too harsh, really. I reached up and flicked off the brights, leaving only a shaded lamp on. By magic, five years disappeared from her face in the softer light. Sweet Jesus, I thought to myself. She's *got* to be over sixteen!

But she didn't look it.

She took the drink from me without glancing down at it, and just held it between her fingers like it was something to hold on to.

"I, I wanted to tell you, Mr. Thomise, just how much I've admired your playing. I, I'm planning to go to Juilliard next year, and . . ."

I smiled down at her. "None of that, child," I said. "Don't you know it embarrasses us old pros?" It disarmed her, of course.

"Oh," she said, very small-girl.

"You haven't tasted your drink," I said, reaching out my own glass till its rim nipped hers. "Cheers."

She threw it back like water, which it mostly was not, and her face got very red, but she didn't say anything. Nor did she choke or gasp. I stared down at her over my drink and she stared straight

ahead, maybe at my belt buckle or something, until I was about to break the silence. Then she looked up, raised her glass, and asked, "Another?"

I finished mine and made us each another.

"Would you prefer something else?" I asked.

"What?"

"THC, hash . . .?" Some women prefer it beforehand.

"Oh. I never . . ."

"Best stick with what's familiar," I said, handing her the glass again.

"Yes," she said, and took a long swallow from it. The silence was peculiarly awkward, and I wondered just where Paul had dug this one up from.

I sat down next to her, carefully, so my weight on the cushions wouldn't unbalance her. "You haven't told me your name," I said.

"Judy," she said. She giggled then, for a brief moment, and took another long sip from her drink.

"Ju-dy, Ju-dy, Ju-dy," I said, exhausting my feeble store of movie-star impressions. "I suppose you've heard that one plenty of times."

She nodded.

"I grew up as The Earl of This and The Earl of That," I said. She turned a little so she could see my face. "By the time you're an adult, you've heard every pun on your name that exists."

"Yes," she agreed, smiling a little. "And they're all awful."

"I apologize."

"Oh, no!" she said, flushing. "I mean, I wasn't talking about *you*—"

The silence fell like a curtain on an act, so I gave her another smile, reached out and let one of my digits run glancingly down the bare skin of her neck and shoulder.

Her eyes, warm and large and brown, locked into mine as I knew they would, and a slow smile began timorously at the corners of her mouth. Her body shivered, but she did not draw away.

A full drink and part of another in short order on an empty stomach: *I knew* she hadn't eaten. It can hit them fast. I let my fingers graze caressingly through the hair at the nape of her neck and then trace their way down her spine. Her dress was expensive and low-backed. Her eyes never left mine.

I reached out with my other hand and took hers. The electrical feedback tingled my fingertips. Her lips parted. Without her own knowledge she began moving towards me.

Her lipstick tasted innocent: sixteen and vanilla. She kissed stiffly, awk-

wardly. It delighted me. She was one of the special ones.

Then, suddenly and without transition, she was at arms' length, staring at me with wide eyes. She looked shocked.

"What's wrong, Judy?" I asked gently.

"I—I don't understand," she said. "This—this isn't—" She couldn't find the words.

Her drink was on the end table. "Here," I said, handing it back to her.

Her fingers closed around the glass and she raised it to her mouth automatically. Something to be doing. Fill the awkward spaces. I took another drink from my own glass. This was going to be better than usual.

She put her glass back down on the end table: empty.

"Why am I here?" she asked. Her voice was slurred, and she sounded confused.

"Why *are* you here, Judy?" I asked. It's a game I've played before. Once again I caressed the back of her neck.

Her eyes half closed, and her expression became dreamy. Then her eyes were wide again, and she was looking searchingly up into my face. "I don't know," she said. But she knew.

"Stand up," I said. I got to my feet and gave her a hand.

"It's hard to stand up," she said.

I leaned over her, and in a not-quite embrace I kissed her shoulder and found the zip at the back of her dress.

"What are you doing?" she asked. Her tone was dreamy.

I unfastened the dress and let it slip from her shoulders to a heap at her feet. Beneath it she wore only panty-briefs. They build everything else into the dress these days, and I admit I've often appreciated that fact.

I bent and picked up the dress. I put it on a hanger and into the wardrobe closet.

"Why'd you do that?" she asked, still standing.

"So it won't get wrinkled," I said, deliberately misunderstanding the question.

"Am I good looking?" she asked. She was staring at herself in my mirror. I joined her within its frame, and kissed her neck again.

"Very much so," I said.

"You haven't taken off my panties yet," she replied. She was quite high.

"I shall," I said. "All in good time." Her breasts were small, but well-formed, and each nipple rose readily at the touch of my lips.

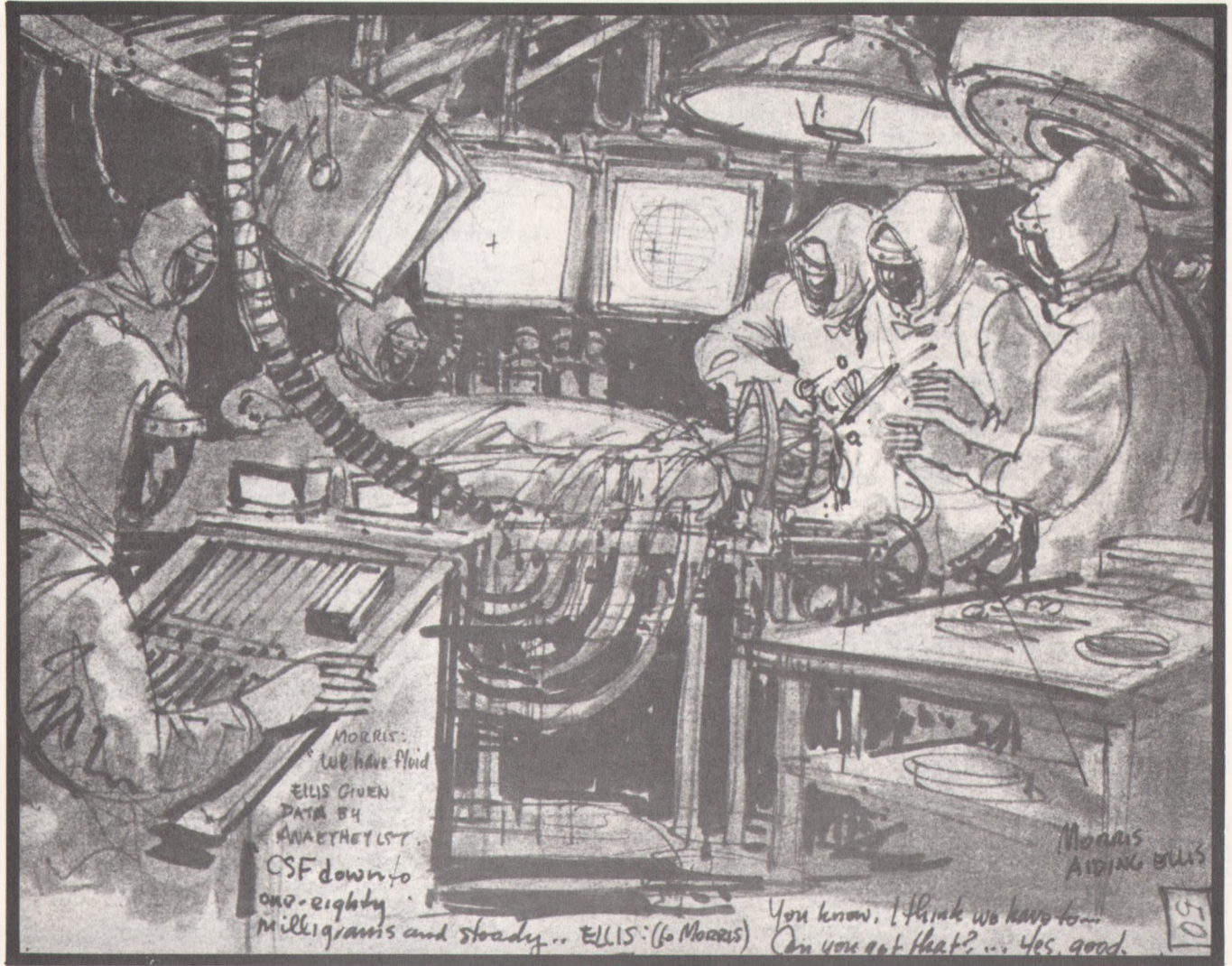
"How can you tell if I'm good-looking

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THE TERMINAL MAN

from page 25

The equipment and knowledge needed to change this from SF to a documentary are only short years away.



terms of success with the unknown terrors of psychomotor . . . we are no better off than the primitives who believed epileptics were struck by the Arrows of Apollo or the thunderbolts of Zeus.

And it is at this juncture, into this *terra incognita*, this domain of fantastic speculation, that **THE TERMINAL MAN** plunges, beginning with a startling projection of a method for humanely restraining the dangerous seizures of Harry Benson, the terminal man.

Harry Benson. Perhaps Michael Crichton's most outstanding character creation (including the many in his suspense novels written under the pseudonym "John Lange"). An acting plum requiring the most careful casting perceptivity.

And though Crichton may be unhappy with the rewritten script by Michael Hodges—the novelist-turned-film director has removed his name from the

script—he can certainly have no sorrow about Hodges' selection of George Segal to play the hag-ridden Harry Benson. George Segal was the perfect choice. If there is an actor currently working in front of the cameras who can match the amazing performances of Segal in *SHIP OF FOOLS*, *KING RAT* and *BLUME IN LOVE* (three films undistinguished save by Segal's charismatic presence), not to mention such triumphs as *WHO'S AFRAID OF VIRGINIA WOOLF?*, *NO WAY TO TREAT A LADY*, the unsung classic *BYE BYE BRAVERMAN*, *A TOUCH OF CLASS* and the now-famous *WHERE'S POPPA?*, then I cannot think of his name. Segal has such a range, such a formidable yet relaxed manner, that his very presence in **THE TERMINAL MAN** makes the film a must-see.

Screenings of clips of the soon-to-be-released film fulfill the expectations Segal's very name promise. He is Harry

Benson, and his story is a contemporary parallel of the Jekyll-Hyde dilemma fraught with humanity and helplessness.

Like most good sf stories, the plot is complex and utterly fascinating.

Benson, a computer technician working with advanced forms of machine intelligence, has been afflicted with extended "blackouts"—times when he develops a Hyde-like personality that replaces his normally gentle behavior, when he brutally attacks both friends and total strangers. Increasingly, Benson has come to believe that computers are taking over the world, replacing human beings. In that respect he is one with the millions in our society who feel ever more and more alienated, threatened, dissociated by the onrush of rampant technology. His paranoid fantasies remain submerged, smoldering, during his everyday life, but they burst loose when he has a seizure. At such times he is apt to attack anyone he suspects of collabo-

rating with the enemy machines. His problem is more twistedly heightened by his awareness of himself as working in collaboration with the machines himself: he is a computer expert, one of the fifth columnists.

Benson's condition, referred to throughout the film in its shortened form as "para-epilepsy," has reached the stage where it is correctable only by an extremely debilitating drug treatment or by a radically new form of experimental surgery.

Despite protests from Benson's psychiatrist, Dr. Janet Ross (a role assayed with extraordinary skill by Joan Hackett), Benson agrees to undergo the surgery. A special medical team at a Los Angeles hospital's Neuropsychiatric Research Unit plant a dime-sized computer and a tiny nuclear powerpack in Benson's body, and a series of wires to electrodes implanted in the amygdala, the posterior area of the limbic system of Harry Benson's brain.

In Crichton/Hodges' extrapolation of this startling new technique, the electrodes have a double-edged function: they detect the distinctive electrical imbalance in Benson's brain that immediately precedes a seizure, and shunt that data to the miniaturized computer. The computer then decides which of the forty electrodes to shock, thereby having the effect of canceling out the seizure before it can take effect and manifest itself as sociopathic behavior.

As the accompanying drawings demonstrate, one of the most fascinating aspects of the superlative and authentic production of *THE TERMINAL MAN* is the operation itself. Sparing no expense, Warner Bros. constructed a gigantic set of the operating theater at a cost of over \$30,000 and then furnished it with actual electronic and surgical equipment valued at nearly a quarter of a million dollars.

Everything from the gleaming laser X-ray machine to the multipositional operating chair to the special computer that oversees the hundreds of surgical sequences that must be followed precisely to successfully conclude the implantation, are either actual devices already in use, or the next closest thing. From start to finish the authenticity of the entire surgical sequence is not only as accurate as exhaustive research can make it, but carries with it an ambience of reality that forces the viewer to suspend all disbelief and for the duration of the film accept that such operations are possible.

But if the truth be told, the com-

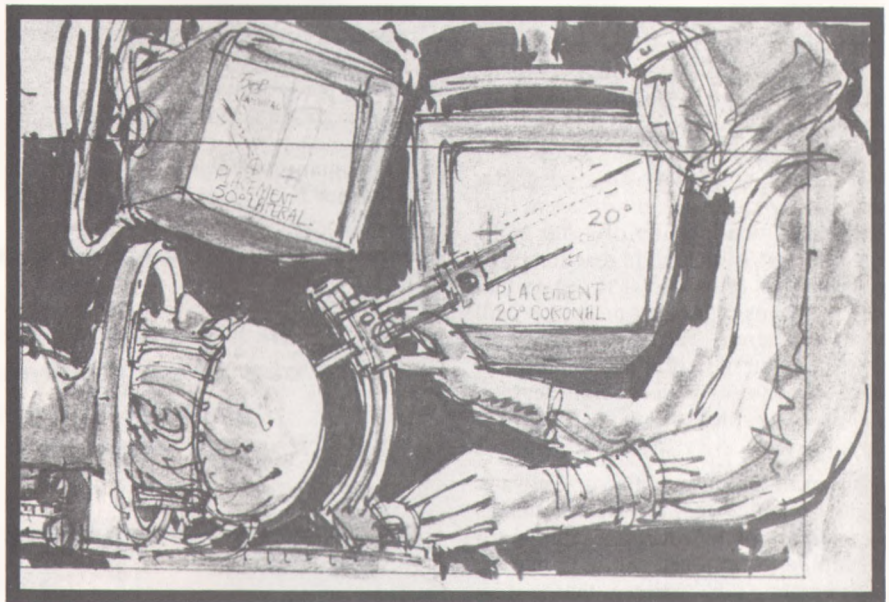
puter/electrode/powerpack assembly is nowhere near a reality. It is once again the creation of the fertile science fiction mind of Michael Crichton and the amazing talents of the Warner Bros. production team. And it is yet another example of the added dimension that can be brought to works of the imaginative by the miracle workers of the contemporary cinema. It is, in very special ways, a realized dream any sf writer would give his royalties to realize.

But if the harnessing of Harry Benson's crippled brain is only a sf dream, it is certainly the next step in mind control experiments that have been proceeding for several decades. All are

tinctly altering their emotional states from rage to calm.

The gap between radio-controlled cattle stimulated to graze in productive patterns over vast pasture lands and computer-guided people ordered to and from routine production line jobs is narrower than we might think, and closing with every advance in biochemistry and electronics. A terrifying thought. Perhaps only a wry and vagrant vision of a fantasist, or perhaps an ominous shadow on the horizon. Are you keeping your eyes open?

Little over a year ago, Dr. Delgado, rather a busy man, announced that he was developing "something like a cere-



based, as is *THE TERMINAL MAN*, on the principle that electrical stimulation of specific portions of the brain can bring about specific actions and reactions. A tiny, five millivolt jolt of electricity on one matrix of cortical cells may produce intense pain, while a stimulus a thousandth of an inch away might induce ecstatic pleasure.

Another jolt in a still different location might summon up a neutral image—such as the taste of ham on rye, to take an example from the film.

Although no one has yet planted a closed circuit control device in a human (as far as we know . . . peculiar rumors come to us from behind the Iron Curtain), that day cannot be far off. As recently as 1969, Yale researcher Jose Delgado implanted radio sets in the skulls of animals and transmitted signals that caused them to perform in as Pavlovian a manner as Dr. Delgado might have wished, even to the point of dis-

bral pacemaker" with the ability to constrict the functions of some portions of the brain in the same manner that cardiac pacemakers control the rhythms of the heart.

How great a leap is it from Dr. Delgado's developments of a cerebral pacemaker to the computer planted in the terminal man, Harry Benson?

Which the greater danger? A society in which the potentiality for mind control exists with the existence of the technology and hardware—history proves: to have it, is to use it—or a society in which a Harry Benson can walk the streets beside us, a human bomb waiting to explode?

Beneath the sheer entertainment and speculation of a film as memorable as *THE TERMINAL MAN*, there is a disturbing sub-text we must all, every one of us, eventually consider.

Even as we consider the total impact of the word *terminal*. ○

GHOST UNIVERSE

from page 47

tion of Dirac's original theory.

The positron was the first evidence of the existence of antimatter.

As the years passed, physicists found that virtually every subatomic particle had its antimatter counterpart having either a reversed electric charge or some other mirror-image characteristic. There are anti-protons, anti-neutrons and some fifty others, including an anti-neutrino. The latter particle was also discovered by the Reins-Cowan team in 1956, and has proved useful in making lucid otherwise inexplicable nuclear reactions in the heart of collapsing wildcat stars.

Previously, it was held that because anti-particles were by nature inimicable with ordinary particles, the product resulting from a collision between a positron and electron would be a scattering of gamma rays. In supernovas, however, such a run-in may produce an unexpected duet—a neutrino and an anti-neutrino, which promptly exit the star for regions unknown. This particular reaction is statistically a rare event, but in the superdense center of a star going nova, enough of these odd reactions take place in a space of one or two days that the neutrinos and anti-neutrinos will take with them all the free energy. Mortally bled, the star crumples, the interior temperature rises to six billion degrees, and the star explodes with inconceivable fury.

But even the power of a supernova is slight compared to the violence that is theorized to occur when a sizable lump of antimatter contacts normal matter. Astronomers now believe that a few ounces of antimatter intersected the orbit of the Earth on June 30, 1908 producing what is now known as the Great Siberian Meteorite Impact. (A very recent alternate theory is that a wandering black hole is responsible, slicing directly through the center of the Earth from Siberia, and emerging from the floor of the South Atlantic. It must have raised a spectacular waterspout!)

It is perhaps fortunate that anti-matter remains on the level of subatomic particles, for the most part, in our end of the Universe. There are speculations that another section of the cosmos is constituted entirely of antimatter, even as ours is of what we think of as regular matter. It's only speculation, of course, for there is no way of proving such an anti-Universe does exist, but there is no fundamental reason it could not. With the advent of ultrapowerful linear particle acceleration machines, physicists have been able to create and demonstrate the properties of anti-particles. And experi-

menters at the Brookhaven National Laboratory in New York State were able to "construct" an antimatter nucleus of the element deuterium in 1965, by combining an anti-proton and an anti-neutron for a slight fraction of a second.

The anti-particles all have extremely short lives, winking in and out of existence in milliseconds or less. Some physicists think this is an anomaly: ordinary particles have long lives, so why should their mirror-images vanish so quickly? It is as though they are not actually "attached" to this Universe, but are instead simply ducking in and out for the benefit of curious physicists.

One curious physicist, Richard Feynman, suggested that what we call a positron is actually an electron that for some reason has become temporally inverted. It is nothing more—or less—than a rather prosaic piece of matter that is travelling into the past instead of moving into the future.

Feynman believed that this tendency to journey backwards in time was neces-

even centuries of experimentation to decide the issue permanently. It is entirely possible that a final settlement may have to wait until scientists themselves can either create or capture sizable chunks of antimatter suitable for laboratory analysis—amounts considerably in excess of today's occasional stray ghost particle or two.

Still, even as theory, this is an astonishing advance beyond the atomic model proposed by Neils Bohr and Ernest Rutherford in the early years of this century; that concept now seems positively quaint and naive, considering the viewpoint afforded by neutrinos, antimatter and time-travelling electrons. If a danger exists in this broader vista of the atom and the Universe, it lies in thinking that the cosmos as depicted by Pauli, Dirac and Feynman is the only one possible. Drawing lines limiting the boundaries of reality is always hazardous and always a failure. Sooner or later another ghost turns up to spoil everything.

In the world of the atomic nucleus, you can be sure there are plenty of ghosties, ghoulies and long-leggety beasties hanging about, just waiting for discovery.

sarily of short duration, because the general flow of time in our end of the Universe is toward the future. It is possible to buck the stream, according to the theory, but for only an instant.

Needless to say, Feynman's concept was greeted with mixed enthusiasm. It did answer some perplexing questions about the physical characteristics, but it at once undermined one of the long-standing tenets of physics: the progress of time is in one direction only. By admitting Feynman's theory, physicists and philosophers would have to scrap the cherished principle symbolized by the phrase *time's arrow* and for many that is simply too much, despite the fact that Feynman was awarded the Nobel Prize for his work in 1965. Opponents of the theory have mustered some strong logical objections, which have not yet been either resolved or refuted by Feynman's proponents; the time-travelling hypothesis remains one of the most controversial subjects in science today, and most observers think it may take decades or

Even an *imaginary* ghost can cause quite a stir.

Such was the case with tachyons.

The speed of light in a vacuum is close to 186,000 miles per second, and is generally considered to be the upper limit of velocity in the Universe. Even the neutrino, massless and chargeless and the closest thing to a totally free spirit thought possible obeys this one Einsteinian rule. Since the Theory of Relativity was announced over fifty years ago the speed of light has been respected as one of the very few inflexible constants in nature.

During the 1960s, however, a few physicists and mathematicians specializing in relativity began to realize that there might be an exception to the cosmic speed limit. One of the most imaginative of this group was a young Columbia University physics professor named Dr. Gerald Feinberg. It was Feinberg's contention that the Theory of Relativity's limitation applies to "ordinary matter and all the other elementary

particles." However, the Theory does permit the (theoretical) existence of particles that do travel faster than light.

These particles, Feinberg theorized, could exist only on the other side of the light-speed barrier, and their velocities could range from 186,000 mps to infinity. Their single limitation would be this: they could not travel any slower than the speed of light, just as ordinary particles cannot go any faster.

Feinberg named his particles tachyons (from the Greek word meaning swift; surely this is one of the great understatements of our time!), and proceeded to work out some of their supposed characteristics. A "slow" tachyon, flying about at just above c (the speed of light), would contain more energy and momentum than one travelling faster. As the speed of a tachyon approaches infinity its intrinsic energy decreases to nothing, and its total momentum shrinks to a minute percentage close to but never actually zero.

Extrapolating on the last-named property, Feinberg determined that tachyons would make excellent propulsive agents for interstellar spacecraft, employing the particles as a rocket exhaust. A hypothetical engine that could somehow "make" tachyons out of ordinary matter would have the capability of reaching 99.9999 etc. per cent of the value of c . Naturally, the ship could not exceed c itself because it would be constructed of normal matter (along with the crew). But next to finding a bonafide space warp, the tachyon rocket appears to be the best hope for commuting around the Milky Way anyone has yet seriously proposed.

For the present, tachyons are only an attractive hypothesis: we have no method to determine their existence, and the single definite conclusion to be drawn is that there is absolutely no theoretical reason tachyons couldn't exist. Such negative evidence is little consolation for the person with an itch to get out and explore the galaxy. It is worth recalling, though, that many other subatomic particles were eventually found simply because nobody could theoretically disprove their being. It could happen once again.

But in another sense it hardly matters whether there are such things as tachyons, or positrons. They are ample reminders that our knowledge is not complete, and never shall be. The final explication of the Universe is very far away indeed. And there are probably plenty of ghosties, ghoulies and long-legged beasts hanging about, as yet unnoticed, waiting for their turn. ○

vertex

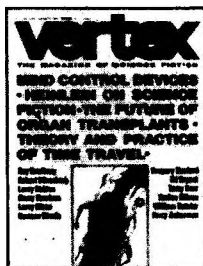
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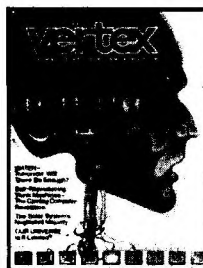
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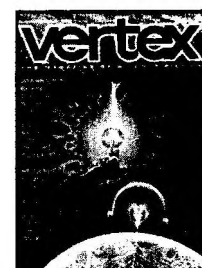
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VERTEX Vol. 1, No. 6

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SIXTEEN AND VANILLA

from page 75

if you don't take all my clothes off?" she asked.

I smiled at her in the mirror and our eyes locked again until she swayed forward and put out her hand to steady herself. "That makes me dizzy," she explained. "Take my panties off."

I did. It really made very little difference to an esthetic appreciation of her attractiveness, but she was growing insistent, and I didn't want to spoil her mood.

Then we were sitting on the sofa again, and she was asking me, between nibbles on my cheek, "You know how old I am?"

"No," I said. "But it doesn't matter." "I'm sixteen," she said, half proudly, half defiantly.

I felt a momentary pang, but shoved it aside. "That's nice," I said.

"You haven't had one as young as me before, have you?"

"No, Judy. Not recently."

"Not when you were sixteen?"

"No. Not then." Hardly *then*.

"Do you like me? Am I nice?"

Very nice, Judy." But a little tiresome.

"Then why aren't you taking *your* clothes off, then?"

I turned her face until our eyes were only a foot apart. "I have a couple quirks, Judy. I don't take my clothes off." I held her eyes. "You'll find it quite as nice."

She stared intently into my eyes until for some reason I had to look away. "I'm a virgin, Mister Thomise. Did you know that?"

I'd begun to suspect as much. "It's all right, Judy," I said soothingly. "You'll still be a virgin."

"But I don't *want* to be a virgin, Mister Thomise."

"Earl," I said. "Just 'Earl,' Judy."

"I want you to fuck me, Earl," she said, with her sweet sixteen lips.

I felt the first acid bite of fear touch my stomach. She had stopped following the script. Had there *been* a script?

"Judy," I said. "You're very young. I want to show you something nice, but a man my age doesn't—"

"What's wrong with you?" she asked. Her eyes were still intently boring into me. "I came in here to get fucked and now you're backing out. What are you, a queer?"

"Judy," I said, "Please. You didn't come in here to get fucked, as you put it. You came in here to hero-worship a big-name concert pianist, because you're a young girl in highschool and you want to go to Juilliard, and somebody left you alone with the big-name concert pianist and you got scared and

you drank too much too fast and now you're trying to be older than you are and prove something to yourself. But I don't think you really want to prove *that* to yourself. Do you?" It had gone sour, and I knew it. No wonder Pual had looked nervous: she wasn't one of his.

I had visions of the money this was going to cost me if I didn't play it just exactly right. Sixteen years old, for Christ's sake! What was I thinking of? They don't grow sixteen-year-old pros in the corn belt—that's strictly a big-city thing.

"I was right," she said, pushing me away and stumbling to her feet. "You're



**He was different,
that she knew, and
could accept. But
she didn't, couldn't,
know just how
different he
really was.**

a queer, and that's all you want, just queer—" she broadsided my face with an openhanded slap—"you just queer—" then she was huddled on the couch, curled in a naked ball, hugging herself and crying hysterically.

I grabbed a towel and wiped the sweat off my face. Then I pulled open the door to see if anyone was nearby outside, listening.

Paul was standing directly outside, his back to the door. Before I could say anything, he'd turned around, his face white. We stared at each other.

"Trouble," he said.

I nodded. "Yeah, Paul," I said.

He sighed, and his face was old.

"Come on in," I said. "See if you can help me get her dressed."

"You do some dumb things sometimes, Earl," he said.

"Yeah."

We dressed her. It wasn't hard. At first she was clenched up, and then she was limp, but the clothes were easy.

"You heard," I said.

"Enough," he said. "Don't you know enough to stick to pros?"

I shrugged. What was I going to tell him? That I'd wanted to believe she was, and that I'd hoped she wasn't? That I wanted, just once, something that wasn't bought and paid for, something real? That I'd never been sixteen and I'd never be sixteen?

You don't say things like that. You can't. It would be like stripping yourself stark naked in front of someone. I've never done that.

"I'll take care of her," he said. "Some coffee, and maybe she'll get sick, and then fresh air, and I'll see she gets home with no complaints."

"Thanks, Paul," I said, and I flashed him one of my most winning smiles.

"It's what I get paid for," he said, and closed the door behind him.

I went back to the mirror and stared into my baby-blues for a long time, staring deep into them like maybe somewhere inside them the sights they'd seen still lingered and I could pursue the past and catch up with it again—and maybe do it all differently.

Then, finally, I unzipped my suit, unhooked my fingers from the arm controls, kicked free the stirrups, and waddled my rump off the prosthetic saddle.

I gave a final nod to the mirror, and the bulky, overweight creature, armless and legless, flipped and grotesque, thalidomide baby all grown up, returned it.

You can chase all you want, but you never catch up with the past. ○

BLOODSTREAM

from page 71

interested in the time?"

"I hadn't the least intention of sitting there meekly for two solid hours!" I snapped. "I—oh, I don't know. I suppose I wanted to try and find the switch for this magnetic lock. Or something. Maybe when his attention wandered for a moment."

"And did you succeed?"

"No," I confessed. "I stayed as long as he said I was going to."

"Doing what? Trying to force him to unlock the door?"

"Force him? No, I was too scared to." Remembering, I felt a prickly film of sweat break out all over me. "Of course, I was angry enough to think about overpowering him, but—but he was so obviously insane. I know he looked scary and underfed, but if he was as crazy as he sounded . . . Well, don't they say lunatics sometimes have superhuman strength?"

"I see." Once again the policeman tapped his teeth with his pencil; the gesture was beginning to irritate me. "So you didn't try and force him to open the door."

"I've told you!" I exclaimed. "I didn't dare! Look, officer, I don't want to seem difficult, but do you realise what the time is? I have to be at work in the morning!"

"I'm at work now, sir," he reminded me with perfect politeness. And, having let that sink in, continued in a brisker tone, "Would you care to go on?"

I wiped my face with the sleeve of my dressing-gown. I said, "Do you know what made it really awful? It wasn't just being shut in a locked room with a madman—it was being able to remember what that madman had once been like. If you'd known him the way I did, up at university . . . Wasting all that talent in a filthy back-street, frittering his life away on some ridiculous fantasy . . . ! Christ, if I'd had one-twentieth of his advantages—!"

Suddenly I broke off, remembering why this man had come to call on me, and was abruptly ice-cold from head to toe. I said, "You—ah—you haven't yet told me what actually happened to him."

"No, sir." The policeman kept looking at me, and then away, and then back again. "I was just coming to that. He apparently died from inhalation of vomit, probably because he'd drunk a great deal of beer on a nearly empty stomach."

"Oh my God," I said in a hollow voice. "He did treat me abominably tonight, but of course it must have been due to his derangement, so . . . But wait a moment! This must have happened only an hour or two ago! What brought

you to see me so quickly?"

"Whatever his other personal habits were like, Dr. Brush was meticulous in posting up the diary on his desk. We found your name noted down for nine o'clock, and your business card had been punched and filed on the Rotadex. And . . . Well, there's only one Christopher Hill who works for the Department of Industrial Relocation."

"But—but I mean why should you have gone to his home in the first place?"

"We had an anonymous telephone call, from someone who said Dr. Brush was a crazy dangerous bastard—if you'll forgive the literal quotation—and ought to be put in an institution straight away. Of course, we didn't take it seriously, but we checked up on it as a matter of routine, and we found him lying dead on the floor."

The policeman put aside his notebook and fumbled in the pockets of the damp raincoat he had kept on when he sat down.

"You see, I neglected to mention that before he died of inhaling his vomit Dr. Brush had been knocked unconscious by a blow to the temple with a heavy blunt object—something about the shape and size of a quart beer-bottle. Ah . . . How long after you hit him did it take to find the switch that opened the door?"

I waited the space of ten heartbeats, and then I got to my feet, feeling my mouth draw down at the corners.

"Until after midnight," I said. "He was right about that, the son-of-a-bitch. But he was wrong about everything else. For all his calculations and equations and charts and things, he was *wrong*."

"How do you mean?" said the polite policeman.

"Calling me a gonad, of course—a cell helping the city to reproduce. He didn't even know what he was, living in that pigsty of a house, up to his ears in garbage. Do you think if I'd been an Isis Idol I'd be spending half my time cursing in traffic-jams on my way to butter up some fat slob of a factory-owner? Do you think I'd be coming home at night to a poky little house like this, and the kind of racket you heard for yourself—squalling kids, nagging wife, hardly ever a decent night's sleep? The hell I would! And there he was mocking me, *mocking* me . . . He was a bloody disease-germ, that's what he was, and the world's a cleaner place now he's gone."

"So if he was a disease-germ, Mr. Hill, what does that make you?"

"A white corpuscle, I suppose—what else? And if I did the job I had to do, I can't be sorry. All right, let me put some clothes on and we'll go." ○

BACKGAMMON

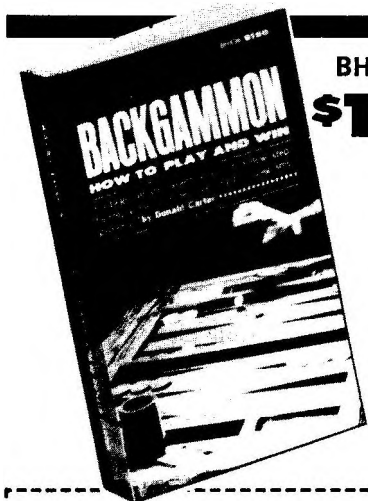
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HUMAN BEINGS ARE A NATION'S BEST RESOURCES

from page 63

thing kosher.

Sure, expenses are high. So are your profits. You've practically got a monopoly now that you've taken over that bankrupt Haitian business. Better than a monopoly. You've got a brain working down here for you. You're not spending a thin dime on R&D, don't forget. And considering what I've done for you, what I'm getting is a pittance.

Myrtle is flying back Tuesday. She'll talk to you.

Arnold

Palacio del Presidente, Apt. 4
March 20, 1982

Dear Ray—

Quit bluffing! You can't get a replacement for me here. I have it on good authority (my close friend El Presidente, and what better authority could you have?) that anyone from HMC who comes down here will be immediately declared persona non grata. Also, my friend tells me that if you attempt to put any U.S. govt. pressure on him, that particular persona might be arrested by mistake and might be killed according to the ley de fuego. Look that one up in your Spanish dictionary—a big one.

Now cut out that shit and be a hard-headed businessman, not a cry-baby. I can supply kidneys for renal transplants in any amount needed. You handle the distribution; I'll be the producer. Strictly fifty-fifty on the net. I'll take care of all the expenses down here. Just make sure you don't pad them up there. The firm of Glastone, O'Neill, and Rockingham will be my attorneys in New York. They have instructions about the contract.

A. H.

P.S. You still read those liberal rags, don't you? How do you believe all that crap? Sure, all the doctors and technicians quit. They're back in jail, those that weren't tried and executed. But we don't need them for what we're doing. All their work is now being done by special teams of trained medical assistants, like our Navy corpsmen. The medical assistants are loyal to El Presidente and me. They get top wages and perquisites.

And never mind that baloney about guerrillas. Who's gonna kill Santa Claus? This country was never richer than it is now. Everybody eats—and not only corn and skinny chickens, but beef and pork. Everyone but the most backward Indians in the mountains wears shoes. Free education to the sixth grade. Even a couple of housing projects here and in San Gabriel inland.

A. H.

Palacio del Presidente, Apt. 4
October 18, 1982

Mr. Raymond Belfair, President
Human Materials Consolidated, Inc.
New York City

Dear Sir:

On behalf of our President, Sr. Arnold Hammond, I am returning herewith the signed copies of the contracts sent on October first, with the changes agreed on by phone initialed.

All funds are to be payable to this corporation at the Zurich bank under the account number previously supplied.

Mr. Hammond sends his personal congratulations to you on securing the services of the noted endocrinologist, Dr. Hans Schoetz, for the gonadal research laboratory. His work on the value of natural male sex hormone should be to our mutual advantage.

On telephone confirmation of the finalized contract from our New York attorneys, the first shipment of 400 kilos of human testicles will be put on the plane.

Very truly yours,
Sigismundo Oliviera,
Secretary to the President,
General Homonomics

1, Avenida de los Martiros
October 12, 1983

Dear Ray—

I thought a little personal note might be in order on this happy holiday.

I really have to thank you for giving me my start in this business and for your continued co-operation. As proof of my thanks, my attorneys have been instructed to give you the diamond ring they will receive in a few days. The ring has historic as well as intrinsic value. It belonged to the Marquesa de Victoria, the last viceroy before the revolution that gave this marvelous country its independence from Spain and brought its inhabitants the blessings of freedom.

Production here is going well, as you know. It is too bad we cannot supply the anterior pituitaries you requested but we are not equipped for neurosurgery. On the other hand, why should we be pigs? We're making enough on other operations; plasma, hair, corneas, kidneys, testicles, ovaries, and pancreases, to say nothing of the skin, bone, and cartilage banks. The thymus removals will be starting shortly. Recruitment is taking place in the highlands now.

When I think of all the good we're doing, I get all choked up. All those blind people back home being able to see again, and the burn cases surviving,

and the advances in plastic surgery, and down here a country lifted from misery up to affluence! But I was always soft-hearted, as you know.

I'm living now in a magnificent building, formerly the Palace of Justice.

Your old pal,
Arnold

1, Avenida de los Martiros
May 5, 1986

Dear Ray—

Sorry about the delay. Some problems have arisen locally. I guarantee delivery of all items within a month, however, once things are straightened out down here.

El Presidente is having some difficulty about getting arms for his peace militia. Can you put the squeeze on some of your friends in Washington? It will be appreciated. He tells me there will be something in it for you if you do, and El Presidente is an honorable man and keeps his word.

Cordially,
Arnold

1, Avenida de los Martiros
August 5, 1986

Ray—

You son-of-a-bitch! You dirty double-crosser! I have to write this because of the instructions you gave your switchboard.

Wheeling and dealing, huh? You sanctimonious hypocrite! I just got the word.

That speech you made about poor suffering humanity was a load of crap, and you know it. You wouldn't have made it unless you had something going. I know the way your crooked mind works. Well, this time your famous intuition is dead wrong.

What do you think the U.N. will accomplish by sending down an investigating commission? You sure won't benefit by it. El Presidente's son-in-law has connections, and I've checked with Major Henderson, the attaché here. We've got the details about your negotiations at Khartoum with the secessionists from Riazana. If that U.N. thing materializes, I warn you—I'll blow the lid!

Don't be cute, boy!

Arnold

Palacio del Presidente, Apt. 4
August 20, 1986

Dear Ray—

For God's sake, don't use the telephone! You should have more sense than that!

Okay—we'll make a deal. You'll curtail distribution for a while until the sentimentality blows over and I'll send only hair and cadavers as I get them.

That will give me a breathing spell anyway while my negotiations go on with General Sueriga of Verdillana. His country wants my services and I'll transfer operations there if need be.

The demographic report was shocking. Who could have predicted such a sharp drop in population? You know—I think the population wasn't here to start with. The census figures must have been doctored. Emigration has been restricted since 1981.

The situation here is very unstable. Some loonies in the mountains—instigated by Catholic priests, of all people!—have been making incursions into the villages. Last week they even made a raid on Tontores itself. That's what comes of teaching people to read. They're easy prey for all sorts of commie propaganda.

We've moved back to the Presidential Palace because of the help shortage.

That big place we had needed too many servants.

The political and production questions are tied together. With the irregular power supply some of the goods can't be refrigerated and gets spoiled. Recruitment is low. Medical assistants keep deserting. Actually, even if law and order is fully restored, I don't see how I can get up to full production for at least a couple of years. So—here's my proposal: I'll give up here altogether. You take me on as executive vice-president in charge of foreign operations and I'll handle things from Khartoum. After all, nobody's got more experience than I have and we could avoid all the bungles we made at the beginning here.

Myrtle is leaving on the next plane out. You can give her your decision. I want to point out to you that there is no sense in HMC losing money by waiting. You have supplies on hand for at least a year. By that time I could have the set-up organized in the other place.

Cordially,
Arnold

Carcel de la Revolucion
September 17, 1986

Sra. Arnold Hammond
c/o Human Materials Consolidated, Inc.
New York City

Madam:

By order of the Revolutionary Council, after due trial on charges of genocide, a crime recognized by the United Nations convention subscribed to on behalf of the people of San Cristobal by the late President, Carlos Francisco Robles, your husband, Sr. Arnold Hammond, was found guilty of those charges and sentenced to death by shooting.

On the appeal of Sr. Martin Hazen, consul of the United States of North America, the sentence was delayed pending instructions from his government and conferences with the Council.

In any event, Madam, he will not be needing any personal effects. Will you please send instructions where they can be forwarded? All other property, movable and immovable, was confiscated by order of the Revolutionary Council.

I assure you, Madam, of my most earnest wishes for your continued good health.

Nicolas Dario
Administrator

Palacio de la Puebla
October 10, 1986

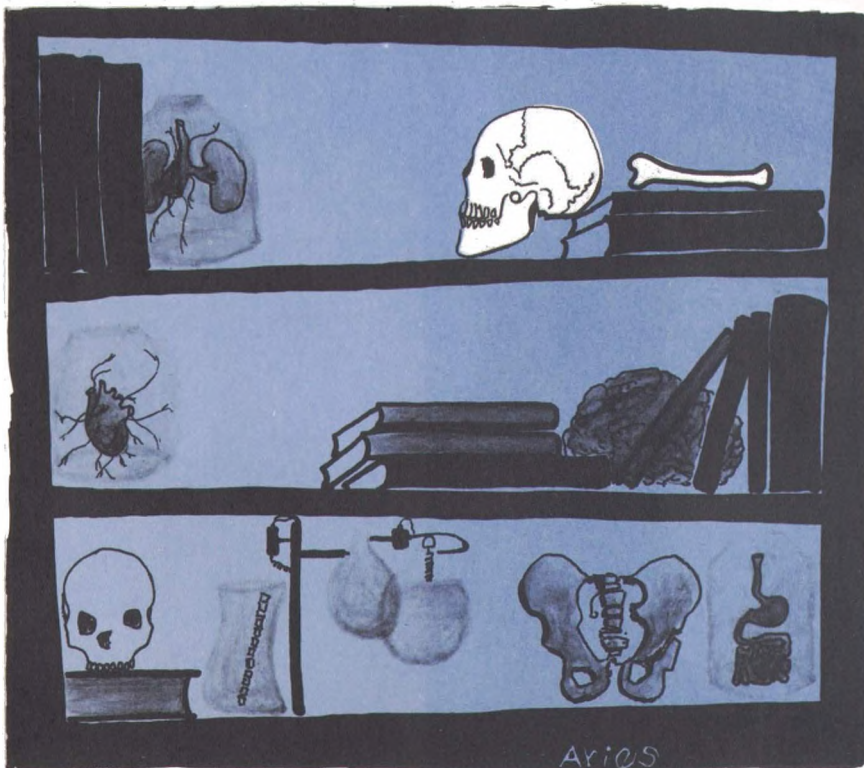
From: the Revolutionary Council
To: the Honorable Martin Hazen,
Consul, the United States of
North America

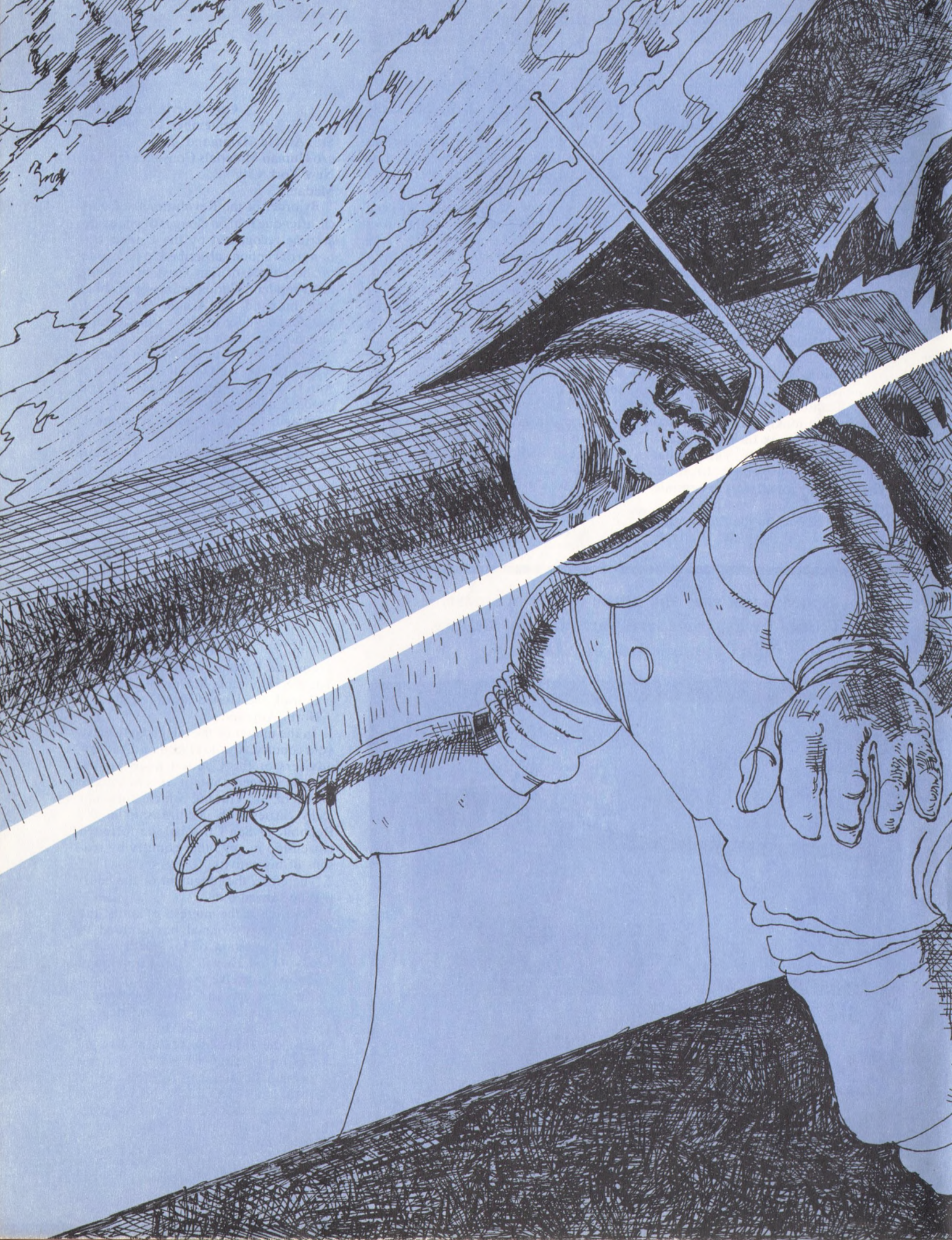
1. In the matter of the alleged citizen of your country, Arnold Hammond, the law advisers of the Council have unanimously agreed that in accepting the Order of St. Vincent, which automatically carries with it citizenship in the Republic of San Cristobal, he forfeited citizenship in any other country by reasons of his nativity.

2. Therefore, the judgment of the court will be carried out.

3. However, in the interests of amity, the Revolutionary Council has decided to leave the question of his death in the hands of God. He will face a firing squad made up of twelve men, three blinded in the right eye and three in the left, and six mutilados of varying degree. There will be only one round of fire. Should the guilty one remain alive by the mercy of God, he will then serve as permanent attendant in the Casa de los Mutilados. Should he be killed, it will be proof that God, as always, is on the side of the oppressed. Homenaje al Puebla! O

**Spare parts was the name of his business.
Trouble was, the spare parts he was selling
didn't come out of any factory.**







He was doomed anyway, dead
as soon as his air ran out.
So why was he worrying about
getting shot first?

STARDRIFT

fiction/Alan Nevas
artist/Monte Rogers

Jackson moaned. The sound of his voice came back to him flat and unnatural, and somewhere there was another sound, a steady keening that filled his ears, pulling him back from the darkness where he had been.

He struggled to regain awareness, to remember where he was and what he had been doing. It was an immense effort not to sink back into the blackness. Only a spark of urgency, a feeling that he must wake up, kept him fighting to pull himself up.

He knew something was wrong. The keening sound was wrong, not the right kind of sound, not what he was used to hearing. Then he knew what was missing. The constant vibration and hum of the space ship was missing. So he wasn't on the ship, but then where was he? He tried to remember and became aware that his head ached. With that came the realization that there were other aches and pains. His whole body felt like one mass of bruises.

He opened his eyes. Darkness. Darkness where? His own room? He felt an instant panic, and with that panic came full awareness. The dark remained, but it swirled and rolled with faint specks of light. Then he knew the truth. The specks were stars and he must be floating free in space, alone, a piece of living flotsam thrown out from the wreckage of the exploding ship.

He looked out through his visor and saw near him a chunk of steel, twisted and torn. It was spinning slowly, as he was, and soon it was lost from view. He saw other debris, and then the ship came into view, massive, the largest thing in his sky. Then the ship began to vanish, and he realized that he was turning on an axis of his own, orbiting the ship like a satellite orbiting a planet.

The keening still was going on, and he realized that it was a human voice, a voice that maintained an animal scream with almost no pause for breath.

He was not alone, then. His panic subsided as he realized there was at least one more survivor. He yelled to attract the other man's attention. He found he had to shout to even hear his own voice. He roared until he was hoarse, trying to break through to the other person.

He was beginning to think no one could possibly hear over that insane howling, and he thought about switching off the receiver-transmitter before he lost his tenuous grip on his own sanity. Then the howling stopped, and he could hear deep sobbing breaths.

"Who's there?" came a voice. "Is anyone there? I thought I heard someone. For God's sake, answer me. Is any-

one . . . ?"

"Take it easy, man!" Jackson answered. "I'm Jackson, third astrogator. You're not alone."

"Curt, is that really you? It can't be. You're dead."

Jackson barked a laugh. "Nope, I'm not dead, and neither are you, because this sure doesn't look like heaven to me. Not that I ever expected to get there."

His attempt at humor was ignored. The ragged breathing gave way to low moans.

Oh, Christ, if he starts screaming again I'll go nuts myself. "Hey, fella, take it easy. Who are you? What happened? I don't remember too much. I've been out for a long time, apparently."

"This . . . this is Adam Rogers, Curt."

Rogers seemed to have just one thought in his mind. That Curt was responsible for the disaster, and that it was his job to make sure that Curt didn't survive any longer than necessary. Even if it meant giving up his own life to get him.

"Right. Fine. Now tell me what happened, slow and easy. There must be others alive besides us."

"Oh, yes, there are. We'd be better off if we were dead, which we soon will be. It won't be easy, dying out here . . ."

"Hey! Don't panic. Tell me about it. Who's left and what happened? I know we were on red alert."

If they hadn't been on red alert they wouldn't have been wearing their space suits and we'd all be dead, Jackson thought. The state of enmity between the expanding earth empire and the non-humanoid Capellans had warranted the red alert in this part of space.

"We can't really be the only ones left," he said.

"I told you we weren't, but we're the only ones left floating around!"

"What the hell's that supposed to mean?" Jackson was startled by the panic in his own voice. "Take it easy. Just tell me about it."

"I was unconscious, too. I got blown into space along with everybody else. I don't know how long I was out, but it was just long enough."

Jackson waited, but Rogers had quit talking. Quietly he said, "Rogers?" He needed, wanted information so he might try to survive. The air in the suit reservoirs wouldn't last forever. They'd both need all their wits.

He lifted his arm and checked the air gauge. Ten hours left, ten hours in which to do something so he could survive until a rescue ship came. The automatic disaster emergency signal in the ship would have broadcasted a "mayday," probably still was doing so. If he could get back aboard, maybe he could seal off a compartment or two for long enough.

"The Pegasus picked up the rest of the crew." Rogers' voice was flat, unemotional.

"The Pegasus? But she wasn't due in this system. How the hell . . . ?"

"She was on her way back to base and heard the first mayday call. She must have reached this position in less than an hour. I know that ship. I served on her and I read her numbers through my suit optics. She must have picked up everyone else that could signal. With all the star interference around here, her radars must have missed both of us." There was silence, broken only by a sob. "I came to just in time to see her pull away. She was out of range for these small radios in the suits."

Jackson thought fast. If the Pegasus still was within any kind of range there was a chance. If they could just get back on board and get any kind of long-range communications functioning, they'd live. First, they had to spiral in. That might not take too long, for the ship would have some gravitational attraction because of its mass.

"Curt, where are you?" Rogers asked.

"Huh? Well, I'm drifting. Orbiting the ship in an ellipse it looks like. Right now I'm passing over the portside aft . . ."

"Can't you be more exact?"

Maybe Rogers had a plan. "Wait until I rotate to face the ship again." Did Rogers really have a plan? At least he seemed to have conquered his panic. That was a good sign. The ship came into his field of vision again. He was moving up diagonally now across the control pod and toward the mid-section. If he continued his present course he would eventually pass over that gaping hole he could see in the center section.

turn to page 98



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HAYES AND THE HETEROYGNE

from page 20

have any simple answers. There's too little data."

Vince blew his nose in the handkerchief Tourmaline gave him. "Have I really travelled through time?"

Obregon nodded. "It's safe to assume you're in a future relative to your embarkation point. How far a journey, I don't know. My instruments still have a limited backtrack capability. Terminex may be able to help me."

"Terminex?"

"The computer."

"I still want to know how I got here."

"As do I. My devices pulled you out of the vortical time streams."

"I remember something like a giant whirlpool." Vince's features set as though he were trying to recall the raveled threads of a nightmare. "It started to suck me down."

"The streams converge," said Obregon, "at the center of all time. And so you're here."

Abruptly, Vince said, "Can I go back?"

"I don't know."

The boy shut his eyes tightly; the muscles of his face tautened in harsh planes. His body again began to shake. Tourmaline reached toward him but Obregon restrained her wrist. After a minute, Vince took several deep, deliberate breaths and opened his eyes. He looked around the laboratory as though seeing it for the first time. "Aren't there any windows?"

"Screened," said Obregon. He clapped his hands twice and sunlight flooded the room, gleaming and glittering on the equipment. Vince stared at the green hillside rolling down to the foot of the towers. "That's more of the Institute there, ahead of us. Off to the left you can see the first houses of Craterside Park. Look further to the side and you'll see the ocean. The desert's in back of us."

"This is the city," said Tourmaline. "Cinnabar."

Vince said, "I've been to New York and Los Angeles. I've never seen anything like this." He hesitated. "Is this the world? I mean, is this Earth?"

"We call it Earth," said Obregon. "I think home worlds are almost always called Earth."

"I wish I were home." Again, his eyes began to gleam with tears. Tourmaline touched his arm protectively.

"What's that?"

They all three looked around as the hitherto silent black box began to buzz.

"I think I'd better be alone with the time machine," said Obregon. "Will you take care of him for a while?"

Tourmaline said, "Of course."

Obregon ushered them hastily out of the laboratory. "I'll see you both later. Vince, have some food and a rest. Don't worry. Things will be fine." He smiled reassuringly.

Then the laboratory blinked out of existence and Tourmaline and Vince were alone on the hillside.

Vince extended his fingers tentatively, as though the laboratory were still there but now somehow transparent. "Where did he go?" "Obregon? It's a little trick he uses when there's a dangerous experiment to be performed. Terminex would be extremely upset should the laboratory ever blow up and take half Craterside Park with it."

"But how does he do it?"

"I'm not a scientist." Tourmaline shrugged. "Just a tourist."

"I don't even know your name."

"It's Tourmaline."

"That's the name of a stone. It's a pretty name."

"Thank you," said Tourmaline. "My friend's name is Timnath Obregon."

"Is he a government scientist?"

Tourmaline looked puzzled. "He's a dilettante," she said. "Just like the rest of us."

"I don't understand."

"Let's go find you a place to rest and something cold to drink." Having firmly changed the subject, Tourmaline took Vince's hand and led him down the grassy slope. Halfway to the towers, a flock of scarlet birds whirred up in their path.

"Cardinals," Vince cried. "I haven't seen any since I was in New York." His voice filled with wonder.

"How old are you?" said Tourmaline.

"Sixteen."

She looked at him sharply. "Years?"

"What else? How old are you?"

Tourmaline remembered Timnath's admonition about culture shock. "How old do I look?"

"Oh, maybe twenty."

"Close enough. I'm a little older."

"Twenty-five? You don't look that old."

She smiled. "Sometimes I feel it."

"You remind me of somebody I know."

"Who's that?"

"Nobody. Just a girl named Karen. You wouldn't want to hear about her."

"Of course I would, Vince."

So he told her, surprising himself by the ease with which he talked now to a stranger; especially a female stranger.

He talked and she listened attentively and soon they came to a door of oiled mahogany in the base of the first tower.

"We'll go to my apartment," Tourmaline said, holding the door open for him.

Vince balked on the threshold. "It's dark in there."

She took his arm reassuringly and led him inside. "It's perfectly safe."

The disorientation was akin to his wrenching exit from the University of Denver Library. Mercifully, this time the experience was much briefer. Vince had the illusory feeling he was strolling down a long hallway, but that his legs were elastic at the joints and that his feet were preceding him by many yards. Then his feet reached their destination and the rest of his body caught up as though one end of a taut rubber band had been released.

His belly twitched ominously. "My stomach again . . ."

"It's the effect of kleining," said Tourmaline. "Take a deep breath. You'll be fine."

There was no dark room and no dim hallway. They stood again in sunlight, this time dappled by leaf shadows. The tree spread its branches around and above them. They were evidently in the middle of a copse; Vince could see the rounded green crowns of other trees surrounding them, but generally lower than the platform on which they stood. The platform, sawn from rough planks, was a disc about ten yards across. Nested in the crotch of three limbs, each several times as thick as Vince's body, the platform was pierced in the center, allowing the major trunk to pass through. Several black wrought-metal ladders and staircases evidently led to the upper reaches of the tree.

It was the most elaborate treehouse Vince had ever seen and he said so.

"I've used it for quite a while," said Tourmaline, "but I've never grown bored with it." She led the way to the staircase which spiraled up around the central trunk. "Let's go to the kitchen."

The kitchen was an oval platform projecting far enough to bathe one end in undiluted sunshine. "Would you like something to eat?" said Tourmaline.

"No, my stomach . . ." Vince started to say automatically, then reconsidered, realizing he was, indeed, hungry. "Yes, please."

Tourmaline slid open a panel in the trunk and extracted a bowl of fresh fruit. "What would you like to drink?"

"Milk, please."

She obtained a tumbler from the same

In their time men, and women, were free from the bonds of morality, which, of course, led to the development of an all-new form of morality.

panel. Looking around, she said, "Oh, I'm sorry," and a set of mushroom-like stools and table sprang up from the floor.

A small heap of peelings and fruit cores stacked quickly in front of Vince. "Do you live here all the time?"

Tourmaline shook her head. "I stay a number of places; but this is one of my favorites. I love to switch the screens off and sleep in the open on one of the upper platforms."

"This must cost a lot," said Vince. "Are you rich?"

Again she shook her head. "Only in the sense that considerable numbers of people enjoy my talents. The Network arranges these homes for me."

He looked at her inquiringly.

"My employer. It's basically an entertainment medium."

"You're in show business?"

"I'm an entertainer."

spread the remnants of Vince's meal out on the platform for the birds to pick. Then the two of them climbed stair after stair to the top of the tree.

When they emerged from the last branches of the crown, Vince sucked in his breath. "Wow!" He stared at the eight-foot, cigar-shaped bag. "A balloon?"

"It's a helium blimp," said Tourmaline.

The metal stairs wound up around the pylon which served as a mooring tower. The blimp was painted bright blue, darker than the sky. About two-thirds of the way back along the stubby body of the gas bag, two pods with four-bladed propellers were suspended. Behind them were steering vanes.

"Where do we ride?" said Vince.

"There's a passenger platform ahead of the engines. It's transparent now."

dress fluttered down and hung like a blue pennant on one of the upper branches. "You ought to try this."

"I'm very comfortable," said Vince.

"You can look at me," said Tourmaline. "I'll be very upset if you continue to pretend there's a blind spot in your eye every time you look at my body."

Vince's face flushed again.

Tourmaline cast off the mooring line. The twin propellers began to revolve. With a gentle whir, the airship launched into the skies above Cinnabar.

Tourmaline waved her arm in a lazy circle. "This is basically all there is to the world: the desert, the greenbelt, the city, and the sea." "Aren't there any other cities?" said Vince.

"Not that I know of. Maybe one. Can you see that?" She pointed out toward the tan waste of the desert; Vince sighted along her forearm.

"What is it, a road?"

"It's the remnant of an elevated train track. I've seen the near terminus. The rails are ancient and corroded."

"Where does it go?"

"I have no idea. I've heard stories that it eventually crosses the desert and leads to a city called Els. No one I know can remember ever having seen a train arrive from Els."

"Haven't you ever tried going there?"

"Never," said Tourmaline. "The desert makes me uncomfortable." She considered. "Perhaps some day, if I get bored enough I'll try."

"I'd try it."

"You've enough to explore here in Cinnabar." She turned back toward the city and began to point out local sights: "The Tancarae Institute, Craterside Park, the Neontorium, Serene Village—that's where the unredeemable elderly live, the Klein Expressway, the Balloon Works—"

"Where they made your blimp?"

She nodded. "There's the Natural History Club, that long, low building. And on beyond, if you shade your eyes, you can see the red bluffs; below them is Tondelaya Beach."

"What's that?" Vince pointed to an ovoid structure gleaming like a giant aluminum egg.

"That's a biogenesis center."

"I'm a zoo major." He added, "I haven't decided how I'm going to specialize, but I know I want to be a biologist."

"The center would probably interest you," she said. "Would you like to investigate?"



Vince finished the final orange.

"More?"

"I'd better not," he said wistfully.

She looked at him speculatively for a few seconds. "Would you like to go for a ride?"

"Where?"

"Over parts of Cinnabar."

"Why not." He spread his hands. "As long as I'm here I might as well see the sights. Can Mr. Obregon get in touch with us?"

"Call him Timnath. If he has anything to tell us, he can reach us." Tourmaline realized Vince was smiling for the first time since he had arrived in Cinnabar; as though it were only now that he had begun to enjoy the adventure.

"How will we go?" said Vince. "Not that—hallway; I've eaten too much."

"I've another vehicle," Tourmaline said. "It's perfect for sightseeing." She

"I'd rather have it opaque, I think."

They came up underneath the shadow of the airship and Tourmaline made a pass with her hand. The passenger platform opaqued—and it was just that: a platform with a single line around the perimeter as a safety railing. Vince cautiously climbed on and was surprised that the platform didn't rock.

"It's perfectly safe," said Tourmaline, following him.

Vince discovered that the platform was upholstered in a soft, comfortably deep pile. On his hands and knees, he carefully looked over the leading edge. The trees swayed below.

"Do you mind if I take this off?" said Tourmaline. "When I fly I don't like anything on my skin but air and sun."

Vince said, "It's your dirigible."

"Blimp." She pulled the shift over her head and tossed it over the side. The

"Sure," said Vince. "Do they really create life there? Where I came from, we're still trying to synthesize a virus."

"Virtually anything can be accomplished in a biogenesis center. They cater to all individual options."

"Even test-tube babies?" said Vince. Tourmaline looked puzzled.

Vince struggled to recall the term. "Uh, ectogenesis. Growing a human embryo outside its mother's body."

Shocked, Tourmaline said, "How else?"

"You know—the natural way."

"In the mother's own womb?"

"Sure."

"That's disgusting," said Tourmaline. "Barbaric. It's Neo-Creelist dogma."

"Where I come from," said Vince, taken aback, "mothers have children."

"Not here," Rouemaline said. "Not if they have any sense."

"Were you—"

"I was decanted. So was my mother and my mother's mother."

"That's really spooky," said Vince.

"In fact, the only one of my friends I can ever recall actually bearing a child in their own body was Timnath."

It was Vince's turn to display puzzlement. "He's a man, isn't he?"

"Don't put stock in superficial genotypes. Somatics can be altered as well. Timnath went to the center and had a uterus implant performed. He carried the child for nearly a full term." She paused reflectively. "Timnath has a more curious bent than anyone else I know, but even he didn't want to carry it through. He had the foetus transferred to a host mother."

"A woman?"

"No a cow."

Vince attempted to digest all this. "Are you kidding me?"

"Of course not."

"But a cow?"

"Animals are very loving mothers." She added soberly, "Since the biological freeing of the rest of us, I sometimes suspect animals have become the new oppressed class."

Vince said skeptically, "What about the maternal instinct?"

"There's no such thing."

"Well, there *was*."

"Let's be precise," said Tourmaline. "There is a biological basis for the sex drive and for the caring for the young of any species. As for a specific drive toward pregnancy—probably once there was one. But after technology liberated us, we acculturated it out of existence."

"You sound like one of my professors

at D.U."

"I studied this when I did some Network propaganda shows. You see, not everybody's liberated—" She stopped as a rock arced over the platform, narrowly missing Vince's head.

The airship had descended toward the biogenesis center in a gentle spiral. Vince peered over the edge of the passenger platform. About thirty feet below, a dozen men and women dressed in somber clothing gesticulated upward angrily. Some threw more stones. Several carried placards:

THERE'S ONLY ONE WAY—NATURALLY

"What's happening?" said Vince.

"Neo-Creelists. I don't think we'll be visiting the center today."

"Who are they?"

"They term themselves creative anachronists. They're misguided romantics trying to capture a past that never existed."

MOTHERHOOD IS SACRED

Several of the women were visibly pregnant.

"They oppose ectogenesis as historically unnatural," said Tourmaline.

"Can't they have children as they want?"

"Of course."

"Then why are they throwing stones?"

"Having found their truth, they worry it like an animal with a bone. They want to force their sick nostalgia on the rest of us."

TWO SEXES! NO MORE, NO LESS!

A furious voice carried up to them: "Down with the heterogyne's whore!"

"They recognize me," said Tourmaline. "Another benefit of being a star." "Heterogyne?"

"Timnath. They're offended by his bearing of his own child."

The voices grew fainter as the airship ascended above the surly crowd.

"We can try the center again tomorrow. The anachronists are likely to become bored and leave. They're more unpleasant than dangerous." She adjusted the airship's controls and then yawned, stretching her arms wide.

Vince watched her breasts rise with

the motion and furiously willed himself not to blush, knowing he had no control over the blood rising to his face. "Now where are we going?"

"I've parked us against the wind." A pair of gray gulls circled the platform curiously and then flew on. Tourmaline moved closer to Vince. "I'm slowly deducing things about your culture," she said. "As with the Neo-Creelists, I'm afraid I'm a little appalled."

"I'm sorry," Vince said automatically.

"There's nothing for you to be sorry for. What appalls me is the thought of a world in which biological options are so limited. It's hard for me to imagine a culture in which progeny are automatically equivalent with the pain and discomfort of mandatory childbirth. Have you ever thought of what it really must feel like to give birth?"

"No," said Vince.

"I suppose not. You're locked into your own role."

"But if you haven't had a baby," said Vince defensively, "how do you *know*?"

"I can extrapolate," said Tourmaline. "Besides that, I've experienced sensory recordings of childbearing. The Network runs them as part of their horror show series." She took his hand. "You must think I'm quite a coward—well, I am. But it isn't just the pain. I've got a feeling that the months of discomfort would breed in me a vested interest in the child—as if it owed me something. I hate possessiveness." Guiding his fingers, she continued, "My body was never intended for that sort of abuse."

Vince tensed, but let himself touch her.

"The girl Karen," she said. "What did you want her to do with you?"

Vince thought. "I wanted her to like me."

Tourmaline laughed. "Be specific."

"To—kiss me."

"Is that all?"

"No."

"Tell me all the things."

He told her; and she did them.

The declining afternoon brought a chill to the shaded platform below the airship. Tourmaline stirred restlessly and woke Vince up. "It's getting cold now. Let's start back." "I really feel relaxed," said Vince.

"You should." She fed power to the blimp's engines and took manual control of the steering vanes. "Would you like to stop by Timnath's and see how he's proceeding?"

"I thought the same thing," said Vince. "Sure." The airship began to drone

Once the biological mysteries are mysteries no more, there would no longer be any need for anyone to be anything other than what he wanted.

He, she or it, or all three in combination, become a possible way of life for anyone who desires a change of life-mode.



across the sky. With seeming nonchalance, Vince put his hand on the pilot's upper thigh.

"All of a sudden you're a cauldron of energy," she said, laughing. "Were you really a virgin?"

He nodded and took his hand away.

"It's not an insult," she said. "I just have grave reservations about a culture that forces a sixteen-year-old to keep those tensions bottled up. It must be very uncomfortable."

"It's awful. You know, I used to sit in the dorm and listen to guys when they came in after a date, and sometimes I knew they were lying, but sometimes

they were telling the truth. And even if I was really young, I used to wonder how long it would take for me, or even if I ever would. Then I'd try to study for an exam or something, but I'd finally give up and lock the door and go to bed; and then I'd—I'd beat off."

Tourmaline listened to the torrent sympathetically, trying to remember how it had been to be young. Her memories of the time were sketchy and approximate. She kissed him and let her head tuck into the juncture between his chin and neck.

"Look!" said Vince. "I can see the lab, and there's smoke—"

The laboratory was a two-story white structure perched at the top of its hill. Dense black smoke poured from the lower floor. They could see human figures milling about outside.

"There must have been an accident," said Tourmaline. She touched the controls and the pitch of the propellers whined up the scale.

"It was the time machine," said Vince. "Maybe it blew up."

The airship angled lower toward the dark plume. One of the capering figures beside the burning lab looked into the sky and began to shout something indistinguishable. They were close enough to hear the crackling flames.

"Those aren't firemen."

"Damn them to hell," said Tourmaline. "They're Neo-Creelists." The airship's engines began to strain against the updraft of heat. The fire had the odor of overdone barbecue. "Timnath—"

Vince pointed. "He's on the roof!"

The swirling smoke parted for a moment and she saw Obregon waving his arms frantically. Below, the Neo-Creelists set up a howl and began to hurl rocks and bottles. The airship settled ponderously toward the roof.

"Wow, it's like a movie," Vince said. "The good guys to the rescue."

Tourmaline said, "Don't be a romantic. The Neo-Creelists are romantics enough."

Obregon didn't wait for the airship to touch down. When the passenger platform was level with his head, he jumped and caught hold of the safety line. Vince and Tourmaline hauled him onto the platform. Gasping for breath, he hugged them. "Good timing," he said. "Get out of here."

The airship began to rise. "The updraft will compensate for the extra weight," said Tourmaline. "We'll get enough altitude; we'll easily make it back to the tree."

From the ground, shrill cries of chagrin trailed after them.

"Did the Neo-Creelists do that?"

Obregon nodded. "One of the most amazing things that's ever happened to me. I'd brought the lab back from Klein space and had taken the time machine up to the second level. Meanwhile, the Neo-Creelists sneaked around and threw an incendiary into the downstairs—I suspect they devised a pressure bomb out of an aerosol can of liquid fuel. There's not much on the second level but storage space, so I climbed up to the roof. But I was getting worried; I was afraid I'd have to jump and take my chances reasoning with those people."

Tourmaline pulled Vince from his small world-view and showed him life as it could be, full of new and wonderful sensations and experiences, just waiting for understanding to come forth.

"Aren't there any police?" said Vince.
"If a district wants rules, it makes up its own. For instance, Craterside Park's big on law and order; but their jurisdiction doesn't extend this far. Besides, no one suspected that the Neo-Creelists were capable of violence."

Tourmaline told him about the mob besieging the biogenesis center.

"They're certainly getting restive," commented Obregon. "I'll be glad when this nostalgia craze ends."

"They wanted to kill you."

"That occurred to me. I might even have accepted, had I not wanted to be able to continue the time travel experiments."

"The time machine!" Vince said.

Obregon said, "No problem. The buzzing was merely an internal alarm indicating that the fuel supply was exhausted."

"No, the fire—"

Obregon looked uncomfortable. "That was the unfortunate thing. By now the machine has almost certainly been destroyed."

"What'll happen?"

"I don't know."

"Am I stuck here?"

"That, also, I'm afraid I don't know."

"Your clothing stinks of smoke,"

Tourmaline said to the two of them. "Throw it over the side; we don't need the weight." Both obliged; Vince, hesitating momentarily.

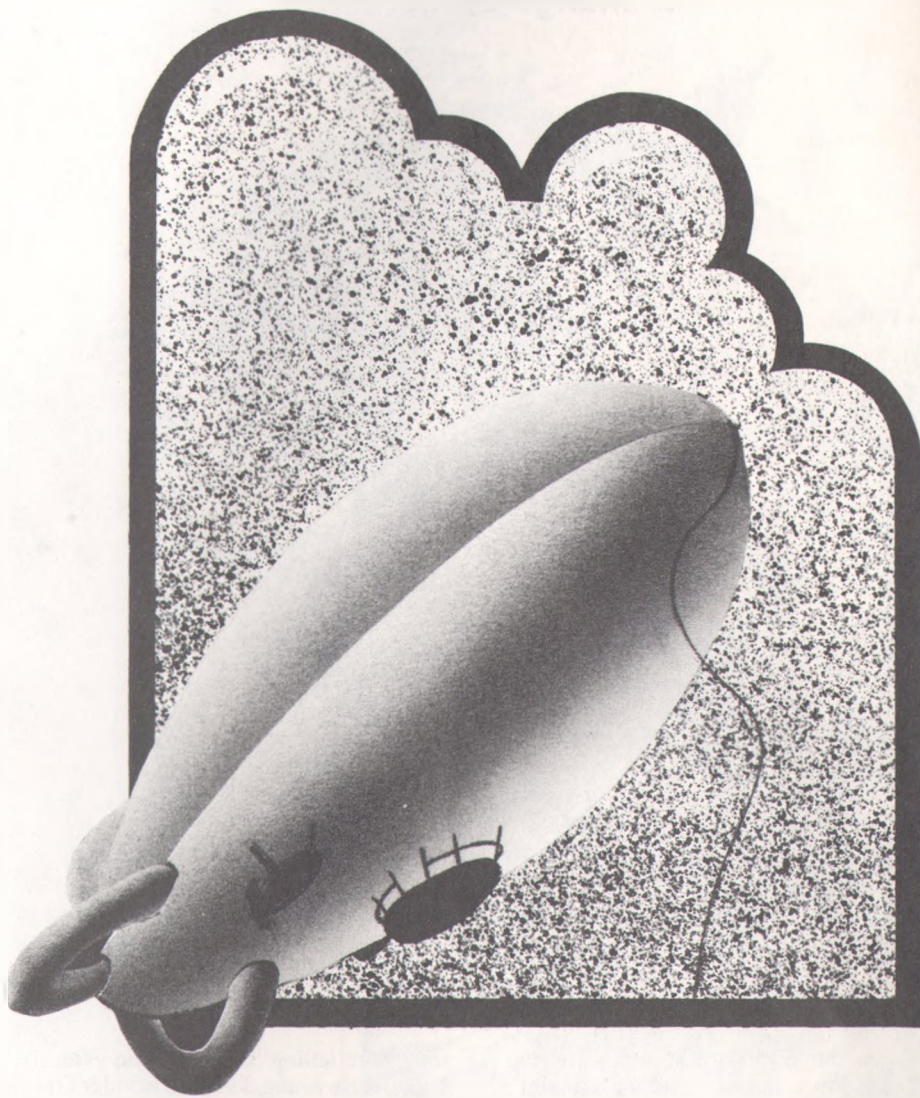
The bright bits of fabric sailed down, disappearing into the dusk shadows before they hit the ground. Vince watched them fall and fade; he felt as lost.

On their level, the trunk of the tree rippled with a tawny firelight effect. Vince remembered the traditional Christmas tree he had never actually seen, but as his grandmother had described it; decorated with flickering candles attached to the live branches. He looked upward through the leafy canopy and could not tell where the candles stopped and the stars began.

Live grass carpeted the deck. To one side, the covering had been built up so that a shallow pool could be sunk. Water bubbled over the inboard lip from a concealed pump. The overflow cascaded off the deck in a thin sheet; long before reaching the forest floor, it dissipated into a fine mist.

Obregon sat between two lily pads, scrubbing his sooty arms. "I feel like I've been running races all day. Do you mind rubbing my back?"

"No," said Vince. He knelt on the



bank behind Obregon.

"A little higher," Obregon directed.

"This morning," said Vince, "when you took the laboratory—away. Did you find out anything?"

"I've been debating whether to tell you. I discovered a number of things."

"I want to know."

Tourmaline descended the spiral stairs from the kitchen bower. Carrying a tray, she padded across the grass toward them. "I went to lengths with the soup," she said. "This is not a programmed recipe."

"I'm ravenous," said Obregon. He splashed onto the bank like a clumsy otter.

The wooden bowls contained a thick stew of meat and vegetables. There were serving dishes filled with fruits and finger-sized loaves of dark bread and bundles of string cheese. A flagon brimmed with a clear, effervescent liquid. Tourmaline filled three tumblers.

Vince sipped cautiously and said, "It's like licorice ginger ale." He raised the glass to drink again, but Tourmaline put

cautioning fingers on his wrist.

"Slowly . . . it's to be enjoyed."

"A toast!" said Obregon. Their glasses clinked dully together. "To you and your contemporary, Mr. Herbert George Wells."

"Really?" Tourmaline said to Vince, "I think that's exciting."

"H. G. Wells? He died before I was born."

"Close enough," said Obregon, "when you're considering all the recorded history of all recorded worlds. I took phrases like 'Denver University' and 'Central Texas College of Science' and your name and programmed a wide-range, random association enquiry of Terminex."

"The computer?"

Obregon nodded smugly. "The results came from one of Terminex's most isolated random information vaults. I discovered a six hundred and forty year 'gramed run of something called the *New York Times*."

"It was a newspaper—"

"Apparently a compilation of all trivial knowledge for an entire culture. But I found a number of references to you. I also discovered what may be a pertinent cross reference to the Central Texas College of Science. It figured in the news on 22 November, 1963, according to your calendar."

"That's today," said Vince.

"I found the reference in a small item on an interior page. It was the report of the deaths of two physicists in a small school in a province called Texas. Rather strangely, according to the reporter, the laboratory had imploded rather than exploded. An investigation was evidently launched, but I couldn't find any other references when I tracked ahead. In any case, the lone report was overshadowed by other news of the day."

"That must be where the time machine came from."

"At a guess, yes."

"But how did I get into this?"

"I very specifically checked, but there were no items about people mysteriously vanishing from a library in Denver."

"You said you found references to me."

"They were later."

"What kind of references?"

"Well," said Obregon uncomfortably. "One thing I read was your obituary."

Vince stared and started to say something, reconsidered, and then gulped a swallow of liquor.

"That's marvelous," said Tourmaline.

"It means you must have returned to your own time," she looked at Obregon.

"Isn't that right?"

"I'm cautious when trying to sort out temporal paradoxes."

"Stuff your paradoxes and tell me."

Obregon sighed. "If I can in fact believe the record of the *Times*, Vince did return to his own continuum."

Vince shook his head dazedly. "My obituary? When—"

"It would be unkind to tell you exactly," said Obregon. "But it was substantially later than when you evidently came here."

"My obituary," Vince repeated. "Then I'm dead."

"No," said Obregon. "You will be. That's an important distinction."

"You've got no concept of comfort," Tourmaline said to Obregon.

"I'm okay," Vince raised his glass shakily. "Why didn't you tell me before?"

"Bumbling though I am," said Obregon, "I'm still trying to avoid overloading your mind with shocks."

Tourmaline said, "I think Vince is a much stronger person than we guessed."

Vince sipped his drink. "This is like a roller coaster. The first few hills were scary, but now I guess I'm getting used to it."

"I don't know if it's any comfort, but I'm coming to suspect that the destroyed time machine is immaterial to your return to your own world."

"Did you check time travel in the *Times*?"

"Yes. There was nothing in reference to you."

"I'm not famous for being the first time traveller?"

"No, not for that."

"Something else?"

Obregon smiled. "That's a surprise I'll leave for you to discover."

The candle effects guttered and began to die. A night breeze stirred ripples on the pond.

Tourmaline yawned. "Come to bed."

"Where?" said Obregon.

"The platform with the furs. The night's turning cool."

"The three of us? Or two?"

Vince stared bewilderedly between the two of them.

"Oh," said Tourmaline. "So I'm the one forgetting cultural differences." She thought for a moment. "Two and one now. Maybe three later?"

Obregon nodded. "That kind of comfort will develop."

"Are you guys talking about, uh, sleeping arrangements?" Vince said.

"Yes. For tonight."

"I can sleep anywhere."

"Tonight," said Tourmaline, sounding maternal. "you'll sleep with me."

The soft, thick furs could be pulled over his face for a feeling of warm security; yet it was not stuffy beneath. The low-velocity component of the night wind circulated through the material. Vince cuddled against Tourmaline's body, wondering fleetingly why he hadn't noticed before that she was taller than he.

"I love you."

"You're such a strange mixture of adolescent and adult," she said. "I feel like I'm eating a pie and not knowing what fruit or spice is going to touch my tongue next."

"I do love you."

Tourmaline laughed softly in the darkness. "All the lovers I've had, and none has ever tempted me to become a mother."

"I don't understand."

"I suspect it's the drive I mentioned this afternoon—the one to care for the young of the species."

"Me?"

"Listen," she said. "Don't you know—you're a child I can love." She moved against him, lifting her leg across his body so that his own leg was held tight between her thighs.

"When I said I loved you. I—"

"Hush," she said. "No more of your romance. Love me tangibly."

Later, before they slept, Vince said, "You've done this with lots of men, haven't you?"

"Naturally," said Tourmaline.

"And not just men."

He absorbed this information. "I must be really square."

"What does that mean?"

"I'm just not used to all this. Earlier, when you and Timnath were talking about who all were going to bed—was Timnath talking about sex?"

"Partially."

"The three of us together? I mean, having sex?"

"If it were mutually agreed to. Yes."

She felt his head shake slightly from side to side. "Back home—I mean in 1963—that's a perversion. It's against the law."

"You're not home," said Tourmaline reasonably.

"It's what I've been taught."

"You've been taught unbelievable strictures."

"I thought I really questioned things."

But not until I got here—this is so wide open. It reminds me of reading about Utopias.”

“Cinnabar? It’s no Utopia. There are more options here than you’ve had before. That’s all. There’s diversity on an asymptotic curve that never quite touches total breakdown.”

“Everything . . .” said Vince. “A heterogyne having his own baby, the ectogenesis center, you, Timnath. I’ve never seen so much freedom.”

Tourmaline’s breathing became regular.

“Tourmaline?”

“What.”

“I didn’t mean to wake you up.”

She rested on her elbows. “You started to ask me something.”

“I really like Timnath.” His voice stumbled. “If—he wants to sleep with us, I don’t mind.”

“Tomorrow.”

“Okay. I mean, I’ll try it.”

“Fine.”

Silence, for a minute.

“Tourmaline?”

“What.” She sighed and sat up.

“Has there ever been anything in Cinnabar you couldn’t have?”

Tempted to say “sleep,” she said instead. “Only boredom.”

“Really?”

“I apologize. I’m tired and I was being glib.”

“If you really wanted, couldn’t you have a child?”

“I suppose. If I really wanted; but I don’t. Why are you so persistent?”

“I’m curious,” said Vince.

“You know why I won’t bear a child. I doubt I’ll ever clone an offspring, or use any other ectogenetic technique.”

“You like to mother,” said Vince, “without actually being one.”

She considered that. “It’s a harmless indulgence. I’m justifiably and unashamedly selfish.”

“One thing we learned was that perpetuating the species is a biological truth.”

“We learned, we learned,” she mocked. “You know so damned much theory.”

“Shut up!” He pressed her shoulders down against the furs. “You treat me like—”

“ . . . a child.”

“Well, I’m not.”

“But you’re close.” She kissed him. “And you’re tired.”

He subsided. “I am.”

She drew him near and sang soft songs. He fell asleep a few seconds before she did.

In his dream, Vince consummated a quest.

The journey not being easy, Vince was obliged to climb a rocky pinnacle. The mountain rose from the otherwise smooth surface of a tan and desolate plain. Vince was acutely aware of textures. The rock faces he scaled, the ledges he traversed, the steep chimneys he negotiated, did not feel like stone. Surfaces, as soft and resilient as flesh buttressed with bone, sank with his steps. Clambering up an uneven slope that reminded him of a field of shoulder blades, he lost his footing and almost fell. He cried out; his voice, peculiarly muffled, did not echo.

“Where are you?”

Nothing and no one answered him.

“Where are you?”

And stopped, confused because he could not recall whom he was calling.

The air chilled and thickened with a hum. *Keep climbing*, said a voice. Vince stared up the mountainscape but saw no one. *Keep climbing*. He continued to struggle upward.

“Just a little farther.” Still no one visible. The voice was a pleasant soprano. “Here I am.”

Vince realized he had conquered the peak and there was nowhere more to climb. The summit consisted of a flat, clear area roughly the size and shape of a basketball court. A being appeared.

It took the form of a golden double helix; whose spirals danced and burned with burnished flames. “It’s about time.”

“It’s a tall mountain,” said Vince.

“Well, it can’t be helped,” said the double helix. “Dream quests are noted for their arduousness.”

Vince said, “Are you God?”

“Of course not,” said the being. “I’m surprised at you.”

“Then what are you?”

“Consider me something basic and something utterly human. How arrogant that you think me God.”

“Well,” said Vince, “I can see that you aren’t an old man in a throne ordering the universe.”

The double helix said, “It was wrong of you to anthropomorphize.”

Vince studied his own toes.

“No matter. I expect you’re wondering why I had you climb up here.”

Vince looked up; the shimmering strands seemed to tug at his eyes.

“I’ve something to give you, to take back to the people.” A flaming strand of RNA messenger darted out and began to inscribe on the mountaintop between them. The ground trembled as though

in torment.

Vince stared at the fiery letters. “I can’t read it.”

“It is the greatest of my commandments. Remember this. Biologically speaking,” said the double helix, “there are no imperatives.” The incised letters arranged themselves: NO IMPERATIVES.

“But there *are*,” said Vince. “We learned—”

“Are you arguing with life?” said the double helix.

“But—”

“Take my word to the people.” The fiery strand withdrew and was rewound by its parent spiral. “Pick it up.”

The fire had burned a border around NO IMPERATIVES so as to form a rectangular tablet. Vince bent and picked it up. The stone was soft and the same temperature as his skin. He gripped the tablet tightly and felt a pulse beating within it.

“Go.”

For a sacrilegious moment he wished to defy the double helix. Then he turned without a word and began to descent the mountain.

The helix called after him, “Beware the barbarians.”

As on cue, the hordes of uncouth barbarians arose from their hiding places among the rocks. They charged up the slope toward him, screaming and rattling their weapons. Their shrill cries filled up his ears as though with blood.

Vince! There are men—they want to kill us.”

“Mmh? Dream . . . Lemme sleep.” Submerged in the furs, he drifted in and out of the dream.

“Vince, wake up.” She shook him urgently. Then she cried out in pain and fell away from him.

He jerked awake, still hearing the cries of the barbarians. “Tourmaline—”

She crawled back into his field of vision, face bloody, holding a jagged pice of stone half the size of her fist. “They hurt me,” she said wonderingly. She leaned over Vince, staring. Blood dripped from her nose to his cheek. “They’ll kill us.”

“And well you deserve it,” said an angry voice.

Vince turned and saw three men standing on the edge of the sleeping platform. All wore the dull blacks of the Neo-Creelists. Each was armed: the first clutched a metal bludgeon, the second held a stiletto with a long blade like a needle, and the third had a pouch filled

Even in this paradise there was a snake—the age-old snake of human intolerance, ready to attack and kill any who dared to be different from the norm those small minds set as being the perfect version of humanity—which, of course, made that perfection a carbon copy of their own inadequacies.



with stones slung from his waist. The third man looked disgusted and tossed a desultory stone. It struck Tourmaline in the shoulder; she recoiled, but did not cry out.

It was the man with the knife who had spoken. "You must know this is not a personal thing," he said.

The assassin with the bludgeon said, "I always used to catch your shows. I thought you were great."

The man with the stones looked even more sour. "Can't we get this over with?"

"You're all insane," said Tourmaline. She touched her fingers to the cut above her eye and then inspected the blood. Vince scrambled to his feet.

"It was those filthy propaganda shows you did for the Network," said the stiletto man.

"Did they harm you?" said Tourmaline.

"Not me. I was already sure of the truth. But I can imagine the effect on more impressionable people."

"I was only trying to educate—"

"To evil," said the stiletto man. "Against nature."

"Nature is healthy when it's diverse. That's all I—"

"Trash," said the bludgeon man. "Sick, perverted trash."

The three assassins moved apart from one another as they advanced slowly across the platform.

Vince cursed his nakedness. "Get behind me," he said to Tourmaline. He tried to push her back to what small safety he could offer.

"You're insane too," she said. "This is not a historical romance; you can't save me."

"I can try." He stepped in front of her.

"Please," she said to the assassins. "Don't do this. I haven't interfered with your lives."

The stiletto man said, "You've gone against the truth. That's sufficient."

The man with the stones said, "Some of the women are grumbling."

"Don't kill the boy," said Tourmaline.

"I expect he's tainted," said the stiletto man, as though that settled the issue. "Now let us finish this."

Vince grabbed up one of the rugs at his feet and threw it over the stiletto man. Arms windmilling, the assassin reeled back. Vince leaped at the bludgeon man on his right. The man held his club before him in a clumsy defence; Vince felt his fist sink into the man's solar plexus. He knew amazement; never before had he fought. He brought back his fist again, but someone grabbed him

from behind—the man with the pouch of stones. Wiry arms wrapped around his chest, pinning his arms.

The bludgeon man attempted to straighten up; his breath ratcheted in his throat. He raised his head and looked hatefully at Vince.

"Lousy cloned bastard!" Vince recognized the voice of the stiletto man behind him. "This for you, motherless scum."

Vince felt a prick low in his left side; a small cold pain like the stab of a hypodermic needle. He tried to wrench free, but succeeded only in overbalancing his captor and they both toppled to the soft floor. Then he heard low wounded-animal cries and realized after a seeming eternity that they were his.

Another cry in the background—Tourmaline. Again he attempted to free himself, but he had no strength. He tried to yell and there was no sound.

Am I dying? he thought. *It doesn't hurt.*

But soon enough it did, and that is when the darkness bore him away in a soft rush of silence.

This time there was no bright dream; only the feel of textures. His boyhood fever fantasies replayed: a tactility both smooth and sticky. Things slid across his skin, yet simultaneously clung. The paradox stirred a core of nausea. The moment stretched . . .

He awoke into a gentle white light. Vince opened his eyes and discovered he was lying recumbent, naked, on a cushioned table. The man standing over him had a familiar face. "Timnath?"

The man shook his head. "Gerald. I'm his son." He wore a pale green smock.

"Are you a doctor?"

"That, too. I'm a healer."

"What happened?"

"You want a catalogue?" Gerald ticked off the items on his fingers: "Two skewered kidneys, complete renal failure, massive shock, a torn aorta, a punctured inferior vena cava. Those are the major items. Would the complete list interest you?"

"No, I don't think so." Vince closed his eyes.

"What amazes me," said Gerald, "is that all your wounds came from a thrust and twist of that meat-skewer of a knife."

"Those men! Where's Tourmaline?"

"Here, of course."

Vince opened his eyes and saw Tourmaline bending down to kiss him. She wore a black choker. "Really, you're all right?"

"Look for yourself." She pirouetted.

There was no bruise on her shoulder, no scar above her eye.

"How long have I been asleep?"

"Three days," Gerald said. "You required some effort."

Vince moved his arms experimentally. "Go ahead. You can sit up."

He did so gingerly. "I can really move like this three days after getting stabbed?"

Behind him, Timnath entered the room. "Remember the *New York Times*? You'll live to fill your obituary yet."

Vince swung his legs down off the table and sat on the edge. "Timnath, you're all right too?"

Tourmaline said, "He's fine; who do you think wandered down from his own sleeping platform and tossed those three assassins off ours?"

"I didn't mean to be quite so extreme," said Obregon. "It was reflex action, and I had the element of surprise."

"The tree needs the compost," said Tourmaline.

Vince said, "I was mostly asleep; I don't remember much. How'd they get up there?"

"Climbed," said Obregon. "Ropes, hooks, bark pitons. I found their gear on the lower porch."

"I've installed some precautions." She smiled grimly.

"Will there be more trouble?"

"I don't know," said Obregon. "I'm afraid they'll continue with their historical fantasies."

"As long as they keep their fantasies exactly that," said Tourmaline.

"Incidentally," said Obregon to Vince. "I've used the last three days to advantage in my temporal researches. My colleagues at Tancarae graciously helped outfit a new laboratory."

"What happened? Have you rebuilt the time machine?"

"No, I recovered your old machine from the remains of my former laboratory. I'm afraid that all that was left was a fused mass of glass and metal. A pity." He shook his head. "No, I've spent my time reasoning out a likely hypothesis for your return to your own time."

"Are you going to build a new machine?"

"I probably could, but I won't. There's a simpler and safer method for your return. In temporal mechanics there are specialized laws of matter and energy conservation. The physical fact that you and the machine are here in Cinnabar and not in 1963 creates a sort of gap in your proper continuum.

"When the machine brought you here,

its self-contained power source provided the energy to maintain the time transfer. The residual effect kept you here after the machine was incapacitated in the fire, so your presence now is an indeterminate condition. There is a faint trail of dissipating energy leading from Cinnabar back to 1963. I call it a T-line. When the residual effect from the time machine can no longer stably maintain you here, you'll be pulled back along the T-line to your origin. Like nature, time abhors a vacuum."

"How long?" Tourmaline and Vince echoed each other.

Obregon said, "I don't know. If theory's correct, it could be anytime."

"Do I have to go back?" said Vince soberly. "Isn't there any way to stabilize me here?"

"I could apply energy indefinitely to keep the T-line open," said Obregon. "But I run into the problem of temporal paradoxes. You have a destiny back in your own continuum. I doubt it would be wise, attempting to fool with that."

"Bitchin'," said Vince.

"What?"

"Nothing. I just realized how much I've been trying to forget 1963."

Tourmaline put her arms around his shoulders and held him tightly.

Gerald Obregon produced a tray of instruments. "Temporal mechanics is fascinating, but there are a few more tests before I can let this person go."

Vince saw a sheen of tears in Tourmaline's eyes. She said, "We'll wait for you outside in the park." She turned and Obregon and she left.

ou owe her quite a lot," said Gerald, lightly touching Vince's abdomen with a cold silver rod.

"I know."

"You don't." Gerald poked hard enough to make him wince. "You didn't listen when I told you you'd suffered total renal failure. She gave you one of her kidneys. Not that it's anything momentous, but it's a very nice gesture."

Vince swallowed dryly, without saying anything.

"The organ is gerontologically stable," continued Gerald. "It should certainly function longer than your own body. My father told me about your culture."

"We've had kidney transplants in 1963," said Vince, "but they don't work if they're not between blood relatives. There's a natural rejection syndrome."

Nonplused, Gerald said, "I've already ensured that your body will accommodate the kidney with a temporary over-

supply of one-handed antibodies. Your body cannot recognize the new organ as foreign. There will be no problem with either two-handed antibodies or blood complement."

Vince looked thoughtful. "You heard what Timnath said about the T-line and my returning to my own time. Even if the kidney's in me, isn't it still Tourmaline's tissue and doesn't it belong here in Cinnabar? It's going to be rough on me if it vanishes and comes back here along its own T-line."

"Timnath thought of everything." Pride tinged Gerald's voice. "He gave me a subminiature energy supply to implant in the kidney; it's only about as large as a few thousand nephrons; you'll never notice. It will last as long as the kidney."

"I'm a cyborg," said Vince.

"So? There's no social stigma."

"That was sort of a joke."

"Mmph." Gerald made a few concluding prods and replaced the rod on the tray. "I'd say you're quite ready. You can even drink all the liquids you wish."

Vince climbed off the table carefully, finding that his legs were weak.

"Get some exercise." Gerald smiled for the first time. "Enjoy your stay."

ith some modification of the frame and skin, and the addition of another helium compartment for increased lift, Tourmaline's airship accommodated three easily. The wind thrummed between the struts supporting the engine pods and brought the salt smell from the ocean. Gulls curiously orbited the craft. Momentarily cold, the three passengers drew around them one of the broad furs borrowed from the sleeping platform.

"What will it be like?" said Vince.

"Sudden," Obregon said. "No suspenseful blurrings in and out of reality, with a final slow fade. Very neat and clean."

"That's a relief."

The airship sailed on toward the red bluffs overshadowing Tondelaya Beach. The gulls, bored, veered back toward the sea.

"My time here's been good," said Vince. He sat between Tourmaline and Obregon. Their arms were around his shoulders. "I know that's a dumb way to say it, but I wanted to try and say how I feel."

"You sound like you're saying good-bye," said Tourmaline. "You don't know that it's time yet."

"I feel like it is."

All three sat silently for a while, watching Cinnabar's towers glide by beneath.

"I've really come to love both of you," said Vince.

"I think the feeling's reciprocated," Obregon said.

"Whatever happens when I get home, I won't forget all this."

Tourmaline, smiling, laid a slender finger across his lips.

"I won't," he repeated. "I can't."

The airship cleared the bluffs and they saw the sand and the steady slow waves.

Vince said, "I don't want to leave. You know, I never—"

He vanished. Air rushed together, filling the space where he had been with an audible *plock*.

"I imagine," said Obregon, "that those kilos of slagged time machine in my laboratory have also plocked out of existence." He wiped tears from his face.

Tourmaline looked away, down toward the clean sand. She said, "I feel very sad."

"—this morning in Dallas," said the radio.

In varying degrees of shock, students and library personnel gathered around the desk.

"—apparently fired from an upper floor of the Texas Book Depository. At this time, no one—"

A whisper of disturbed air swirled behind them. No one noticed.

Vince Blake stumbled forward, fingers pressed against the cold metal reality of the bar of the revolving door. Disoriented, he emerged into the open air where two coeds, climbing the steps, giggled at his dazed look.

He shook his head and decided that today was one day he could afford to cut his zoology quiz. That evening he returned to the library to research the current state of immunology in regard to the rejection problems of organ transplants.

Do you suppose he's all right?" said Tourmaline.

Obregon said, "I know he is."

They lay in a striped red and blue hammock strung between two of the topmost boughs in Tourmaline's tree. It was a place to listen to the busy insect noises in the leaves around them. The afternoon sun burned their skins a richer brown.

Tourmaline trailed her fingernails down Obregon's chest. "Will you tell me now about his obituary?"

"It wouldn't depress you?"

She shook her head.

Obregon said, "He won a Nobel Prize."

"Is that good?"

"Apparently the best of his time. It was awarded for his achievements in

genetics and human reproductive biology."

"Then he remained in the life sciences as his chosen field. That's good."

Obregon nodded. "He became known as the so-called father of the biological revolution, a title that evidently afforded him great amusement. It was an odd achievement to gain that distinction. He was a strong individualist in a time noted for team approaches to scientific research."

"Did he remain unmarried?"

"Yes. Why?"

She laughed. "I was afraid I'd find out that he had lived a long and monogamous life with someone named Karen."

"He was mourned by his own descendants."

"That's good."

Obregon paused. "Vince was also reviled by most of his own generation. In the last years of his life he was popularly termed a traitor to his species."

"Tell me," said Tourmaline.

"Vince pioneered in ectogenesis."

Tourmaline slowly began to smile.

"He had a flare for the propaganda value of public exposure. When he entered his maturity, he bore a child. The cultural impact was incalculable; he was the first woman-alternate, the first heterogyne."

"Magnificent," said Tourmaline.

"There's more. Receiving the first rejectionless implant of a uterus was only half the experiment. The other half was the embryo's origin; it was cloned from Vince's own body tissue."

Her eyes widened and she opened her mouth to speak.

"The tissue came from his kidney. He named his daughter Tourmaline."

Tourmaline was speechless.

"One could say that at long last you're a mother," said Obregon.

"And a father."

He said, "And that."

"Is there a happy ending?"

"I hesitate to tell you," said Obregon. "He was assassinated by persons unknown. His martyrdom aided the movement his supporters founded."

She stared away toward the trees below. "Was he old, by then?"

"He was old."

"I don't know whether to laugh or cry."

"Whichever," he said. "It was a good ending."

"Then I'll smile," said Tourmaline.

Their bodies touched and, for a moment, they were three together. Then only two again, and the two wept because they felt the loss. ○



He could take a good look at the damage then.

He told Rogers about his course, then the ship drifted from his vision and he faced the deep black void with the specks of stars. One of them might be the Pegasus, but then it could be over on the other side of the ship. Anyway, in a matter of hours it would be invisible.

"Good." Rogers said. "Listen! I'm in orbit nearly opposite from you. I've been figuring. The way we're going, in about two or three minutes I should be passing over the hole where whatever it was hit us. Look, when you pass over the hole blink your suit lights. I'll do the same, and we can see how close we are."

"Sounds good, use the hole as a reference point, right? I should be over it in about five minutes. I think my orbit is slowing down, and I may be drifting in toward the ship."

If I get close enough, I can grapple the hull and pull myself in. Then he found that the magnetic grapple and nylon line was not on the suit. The raw ends of the pins were there, but no grapple. Must have been torn off somehow when I blew out. I came that near having the suit itself ripped open.

"Yeah, I am, too." Rogers answered. "Look, I just gotta see you or I'll lose control again."

"Okay, I understand." He didn't want the other man screaming again.

"Your lights, don't forget to blink them as soon as you get over the hole. I'm very near it now."

"I will. The hole is coming up on me now." Apparently, their orbits would meet over the hole. Damn! His rotation was turning him away from the ship. There went his chance of looking into the wreckage. Now it was time to blink. He slowly moved his hand to the waist belt of the bulky suit.

He twisted the knob and the interior lights went off, on, then off again. He wondered if Rogers could see him, if he was facing in the right direction. The other man was silent, not even breathing hard enough to be heard now.

"Hey!" he shouted. A light had flashed, far more brilliant than the light in his suit. It stunned his optic nerves for a second, then was gone, leaving a violent after-image. His rotation increased drastically. Even through the suit's protective layers and air conditioning, he felt a shock of blistering heat. A laser beam had almost hit him.

"What the hell?" he yelled. "What's the idea? Are you nuts?" He tugged his own weapon from the front of the suit as he spun around to face the ship again. A second beam went past him and cut a hole in a piece of wreckage. He

searched, but Rogers was not in sight. Then he heard him.

"I'll get you the next time! If you had been navigating worth a damn we wouldn't have been hit, we wouldn't be floating around out here waiting to die. Next time around, I'll get you!"

"Rogers! Listen!" But the other man seemed to have passed beyond reason. My God, he'll try to kill me again on the next pass! Jackson thought in panic. He switched his suit lights off and listened to Rogers' ravings.

No one could have stopped the accident. Jackson recalled the instant the object had appeared on radar, moving at such incredible speed that it had moved onto the long-range screen and then off in a bare second. The chief astrogater had just had time to hit the red panic button with his fist when the wrenching shock had brought disaster. The explosion of air from the ship would have sucked out anything not fastened down.

He clutched at his laser gun, frantically searching for Rogers' figure each time he rotated toward the ship. The verbal abuse continued, but now the other man was almost incoherent. He reached over and turned off his radio. The sudden silence increased his sense of loneliness and isolation.

He set the gun on low beam. That should be enough to damage Rogers' circuits or cause enough of a surge to stun him. He saw he would be facing the ship when the hole came up this time. He was in darkness. That would be to his advantage if Rogers was looking for a reflection.

But Rogers saw him anyway. Just as he got to the rim of the hole a laser beam flashed past him and dug into the ship. Jackson fired back, and saw his beam go shooting off into space. I didn't even see him, he thought. I've got to be more careful or he'll kill me.

On the next pass he was ready. He saw a glint of sunlight on a spacesuit and fired just as Rogers' beam went below him. He snapped on the radio and heard Rogers' curses. Missed him, he thought.

"Rogers!" he yelled. "Shut your mouth and listen. It was no one's fault. That thing came in too fast. It's happened before."

"Yeah, it happened to us all right because you didn't give us a warning, you bastard! You were doping off and not paying attention."

Jackson snapped off the radio. He checked the air gauge. Still enough time, if that nut doesn't kill me first. He had drifted perceptibly closer to the ship. But what do I do if we both get back on

board?

I'll have to kill him, there's no way out, he thought. It will be better for Rogers as well as me. He brought the laser gun up and turned the dial to full power. That would cut its way through anything.

But the next pass over the hole he was facing away from the ship. Rogers fired twice, and the second beam came so close he felt the shock of the heat wave. He must be in a poor attitude, too, or he'd have killed me then, Jackson thought as he drifted over the ship in his narrowing ellipse.

The hole was coming up again. He braced himself with grim determination. His rotation was favoring him this time. He would be facing the hole. He tried to figure out just where Rogers should be from his position the last time he had a glimpse of the space suit. Jackson raised his gun and aimed in that direction as he neared the hole.

So he could be sure of a hit he snapped on the radio again. Rogers had grown silent. He must be too intent on killing me to talk, Jackson thought. He aimed down the length of the bulky barrel of the laser gun at the spot where he was sure Rogers would be. He saw a moving light and gasped.

The Pegasus was back! Between him and the ship he could see the glint of Rogers' suit.

An extra vehicular activity pod left the huge space vessel and moved toward him. He waited silently, acknowledged the query about his being alive or not, then waited silently as the mechanical grabs reached gently for him. He was carried back to the Pegasus and taken aboard by two crewmen on life lines.

They stripped his suit from him and he looked into Rogers' eyes as a medic gave him a shot. Then the world faded away once more.

He awoke in a bed. This sick bay looked like any other. A medic bent over him and took his pulse. "You woke up before he did," indicating Rogers on the next cot. "Dr. Hiller gave him quite a jolt."

"How is he?"

"As good as can be expected, I suppose. He was kind of incoherent. Wanted to apologize to you about something."

An officer sat down on the bed. "You know, Mr. Jackson, you two are very lucky. One of our men on the scopes saw the twin flashes of light at regular intervals. If it hadn't been for that you'd be . . . well, dead after while. How did you two think of using the lasers to signal with anyway?"

"Sir," Jackson managed, "you'll have to give Rogers the credit for that." ○

REPLY TO A LADY

from page 8

the sexes. They've treated subjects like expeditions to distant planets, oceanographic engineering, the politics of civilization on a galactic scale. One can only get so much into a given wordage; and in the early days, book-length science fiction was not common. Besides, even in a novel, it isn't practical to play Dostoyevsky. That's better done in the "mainstream" format.

Why should Hal Clement's *Mission of Gravity*, say, bring in a love interest? Its fascination lies in the depiction of an alien world and alien beings thereon. For the same reason, it employs, or at any rate implies, a more or less Middle American background for the human characters. Their ordinariness sets off the strangeness of the nonhumans, while if they were—let's assume—citizens of a post-Mao Chinese empire, it would confuse the issue too much.

Granted, for purposes of that tale they could as well have been women as men; or both sexes might have been present, casually mingling. But it didn't happen that way, and to suppose that it didn't happen because of prejudice on the author's part is nonsensical, especially since women play active roles in other works of his.

Granted also, it would have been possible to throw in a few touches here and there, indicating differences between the Earth of that future and the Earth of today. But this would have been a merely literary grace, and in the present context, "merely" is a legitimate adverb. Clement was not writing about Earth, or even about men except incidentally.

It should be remarked in fairness that I don't know if Ms. Russ has ever cited this particular book. But *Mission of Gravity* does go to show that the frequent absence of women characters has no great significance, perhaps none whatsoever. Now let's go on to cases where they do appear.

The fact is that already in its youth American science fiction was more favorable to women than any other pulp writing except, conceivably, the romances, about which I am ignorant. Probably it was more so than slick writing too, considering how the latter's doll-like girls were seldom varied by anything except an occasional Tugboat Annie. Female authors such as C. L. Moore and Leigh Brackett did use androgynous names, but their sex was no secret, and if they had chiefly male protagonists, it was not from necessity. Thus, the former's Jirel of Joiry was a popular series heroine. Male authors often created, or tried to create, admirable

women, especially after science fiction began to emerge from adolescence under the aegis of John Campbell. (Aside: it was not he who proposed supplying the Mars base with a brothel, as Ms. Russ maintains. It was the astronomer R. S. Richardson, well known for tongue-in-cheek humor, publishing not a story in a science fiction magazine but an article in *The Saturday Review of Literature*.)

That archetype of space opera, E. E. Smith's Lensman saga, made Clarissa Kinnison the awesome superior of almost everybody in sight. Her daughters were fully as gifted and active as her sons. Much though she respected the intellect of Mentor the Arisian, she found repugnant his basic sexlessness, which her husband was not sensitive enough to care about. On the planet Lyrane, the women alone were fully human; the males were nearly mindless, mere breeders—yet, after a period of culture shock, those women learned to accept the sex-equality ideal of galactic civilization.

Stanley Weinbaum's "Black Flame" may be too masculine, his Vanny in *The New Adam* may be over-feminine, but neither is extremely so; and remember how tragically short a time he lived to write. Remember too that in one short story he shows a woman operating independently on the interplanetary frontier, while in two sequels she is her husband's able partner. Other authors imitated this figure or invented her by themselves, e.g., Arthur K. Barnes' Gerry Carlyle. In Jack Williamson's "Seetee" series, two different women hold down difficult, responsible, sometimes dangerous jobs. The society of A. E. van Vogt's *Slan* is male-dominated, but then, it is not described as being a good society. The superhumans practice equality among themselves. In other narratives, van Vogt's women tend to be pretty formidable—but so do his men. L. Sprague de Camp gave us a number of believable, appealing female personages. The list could easily be lengthened.

Ms. Russ complains that almost no science fiction shows us anything about everyday family life, particularly with regard to children and their rearing. This is true, but again I must declare that very little science fiction has had occasion to. An obvious exception is the work of Zenna Henderson, well received by readers. A much earlier one is *Beyond This Horizon*, by Robert A. Heinlein, a book which all by itself refutes her claim that he can't describe real man-woman-child interactions. (And what about the delightful matriarch of *The Rolling*

Stones?) From the same period we can likewise bring "Mimsy Were the Borogoves" by the Kuttners under their Lewis Padgett pseudonym, which is about nothing but children and parents, and a good deal of early Ray Bradbury.

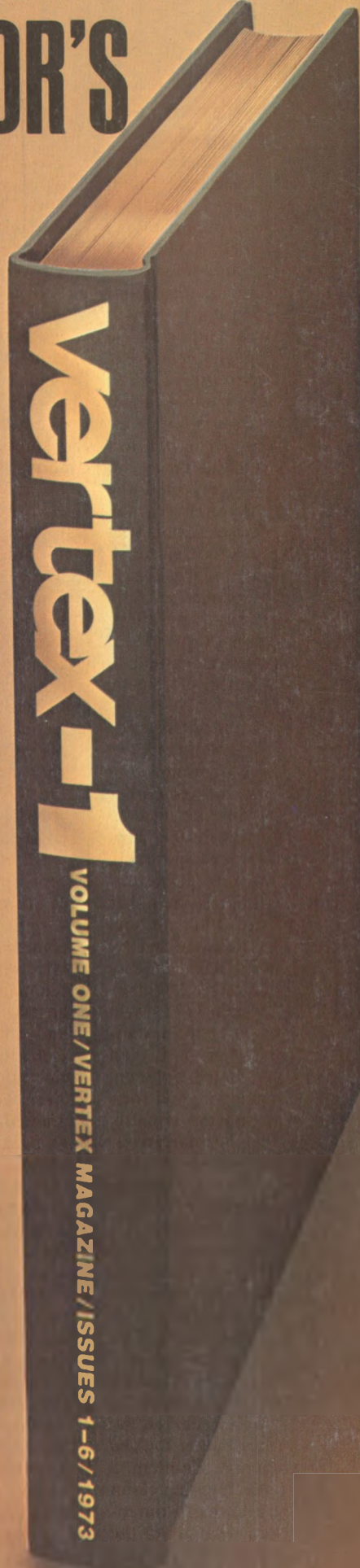
In the 1950's, largely due to the encouragement of Anthony Boucher, we began to see numerous stories about women per se, treated as female human beings. But such had occurred before, notably in C. L. Moore's beautiful "No Woman Born," published by John Campbell in 1944. By now this kind of thing is, happily, commonplace. To name a single example, there is James H. Schmitz's well-known Telzey Amberdon series.

Certain writers, Isaac Asimov and Arthur Clarke doubtless the most distinguished, seldom pick themes which inherently call for women to take a lead role. This merely shows they prefer cerebral plots, not that they are antifeminist. Indeed, Asimov's Susan Calvin is the brilliant protagonist of numerous intellectual-puzzle tales. We should recall too his young girl genius in *And Now You Don't*—which, incidentally, does show life styles quite unlike today's. Clarke's *A Fall of Moondust* includes at least one competent, attractive female.

If I may mention myself again, I could prove my claim to gynophilia by a lot of titles; but four should suffice. Though *Virgin Planet* was intended strictly as a comedy, it does show a worldful of isolated women managing quite well, while the man who rediscovers them is rather an ass. The lead females, both human and nonhuman, in *The People of the Wind* strike me as being generally superior to their male counterparts. In *Tau Zero*, complete equality is taken for granted; the ship's captain does happen to be a man, but his first officer is a woman, and when his morale collapses she takes over most of his functions. *The Dancer From Atlantis* tries to portray an absolutely indomitable woman, who is at the same time warm-hearted and intelligent.

Anybody conversant with science fiction can think of case after case, author after author. Ms. Russ' charge of sexism, like her charge of ethnocentrism, will not stand up unless one deliberately sifts the evidence, which I don't believe for a minute she would do. I think she simply let her fervor in a cause run away with her. But the real world holds enough bias and stupidity to keep us occupied. Let us not waste energy pointing in directions where they do not have any important existence. ○

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