THE SCIENCE FICTION
analog
SCIENCE FACT

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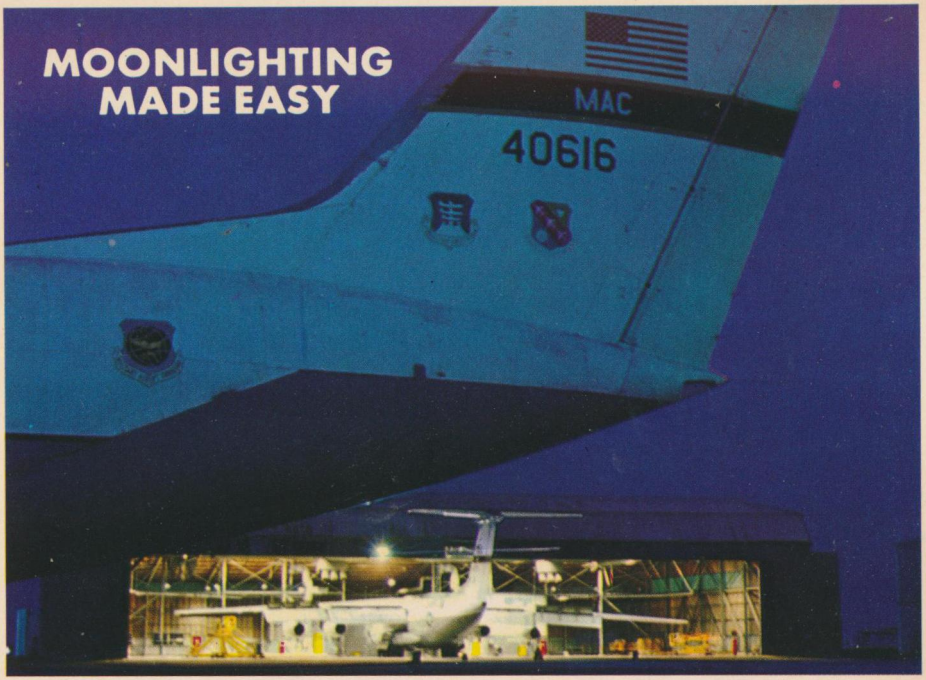
EXTREME PREJUDICE
Jerry Pournelle



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THE IDEA FACTORY

There are nearly forty-five years' worth of ghosts peering over my shoulder. The complete file of Astounding/Analog issues, starting with the January 1930 Astounding Stories of Super Science, sits on the bookshelves behind my desk.

Since that very first issue, Astounding/Analog has been a magazine of ideas, a meeting ground for new concepts and opinions, a place that both writers and readers turned to when they wanted to sharpen their wits. Certainly, once John W. Campbell hit his stride as Editor, the magazine became a veritable Idea Factory.

In fact, due largely to Campbell's all-pervasive influence, science fiction has generally become known as "the literature of ideas." In a more disparaging tone, critics have pointed out that many science-fiction stories have The Idea as their hero, rather than human characters. In truth, we have all seen plenty of stories that were little more than a clever idea, sketched out in barely fictional form.

Ideas are important. They are not the be-all and end-all of science fiction, but they are a necessary ingredient in any good science-fiction story. Yet many outsiders have asked science-fiction writers, "Now that we've gotten to the Moon, what's left for you to write about?" And at least one prominent writer in this field, who has stopped writing science fiction, has reportedly said that all the good ideas have been used up, and there's nothing left to do but rehash them.

It would be simple to use Isaac Asimov's put-down. When asked what's left to write about, the Good Doctor invariably says, "What's left? Only *everything!*"

But let's examine the problem a bit more deeply.

Every week, I see dozens of

manuscripts that groan under the burden of the same tired old ideas, ideas that were rusted with age twenty and thirty years ago: the last two survivors of a global disaster turn out to be Adam and Eve; the "astronaut" struggling to get out of his "capsule" turns out to be a baby being born; the interstellar explorers find a new planet peopled by strange, barbaric, semi-intelligent creatures—the planet is Earth and the creatures are us. Most times these stories are written in the "tomato surprise" format: that is, the author saves the stunning surprise until the very last line of the story. It wasn't even a good technique when Verdi used it in *Il Trovatore.*

Then there are the stories that are instant clichés. Stories about the energy crisis or Watergate or campus unrest that would have made good science fiction ten years ago, but are not science fiction today, even though they may be set on Mars or Alpha Centauri. Science fiction is not "with it"; science fiction is—and has to be—*ahead* of it.

Most of these stories come from new writers who haven't yet learned how to dig deeply into their imaginations and come up with new ideas, original concepts. Still others get started on a good story line, but don't have the skill or courage to follow where the story logically leads. They frequently chicken out of a difficult plot situation by letting the protagonist die or commit suicide. Which is hardly the way to treat an audience of problem-solvers!

Yet there is a steady flow—albeit a slim one—of stunningly good stories by brand-new writers that are original, innovative, thought-provoking. In the twelve most recent issues of Analog, the Analytical Laboratory voting has given first place to two new writers and second place to eight; a remarkable showing when you consider that most of these issues featured serials and lead novelettes by "old pros" such as Gordon R. Dickson, Poul Anderson, Stanley Schmidt, Jerry Pournelle, and William Cochrane.

New writers can and do turn out good stories; stories that are rich in idea content *and* the special excitement of powerful fiction. And the readers respond to them accordingly.

The greatest disappointment of this Editorship is that some of the older writers, whose names and works we grew up on, have gotten out of the habit of tinkering with new ideas. They plow the same overworked ground in story after story, repeating themselves rather than seeking new territory. These stories don't get into Analog.

These older writers aren't the only ones who cling to the past. Whenever a letter arrives at this desk with the opening, "I've been reading Astounding for more than twenty years . . ."—it's a complaint

that the magazine is now featuring stories "that John would never have bought." Of course! John bought stories in the Sixties that he would never have bought in the Forties. Times change, tastes change. There has been a steady evolution. The Editor, the writers, the readers, the *world* keeps on changing, evolving, moving with the inexorableness of time's arrow.

No Editor would publish stories that are twenty years old in style and subject matter—not if he wanted to keep his audience. The nostalgia trip may be fine for anthologies, but magazines are the cutting edge of the science-fiction field, the place where the newest ideas and newest writers are tested.

Some of our readers are upset about the increasing realism in Analog's stories, especially as regards sex and language. It's interesting to realize that John Campbell was attacked back in the 1930's for shaking the field by insisting on realistic stories. In those days, realism meant stories that had solid scientific backgrounds and believable characters. Some readers couldn't stomach Campbell's "new realism." But very quickly, he built up an audience that would no longer accept the pseudoscience and cardboard characters of the earlier type of science fiction.

The great majority of today's audience also want realism in their science-fiction stories. Good science

and good characterizations are taken for granted. The audience has matured to the point where some inclusion of sex in a story no longer sends everyone into a hot sweat. After all, the entire nation's attitude toward sex has liberalized considerably over the past generation. We're almost back to the pre-Victorian attitude, but not yet as far as the Elizabethan.

The same goes for what has euphemistically been called "strong language." Today's readers don't mind seeing in print the words that they hear and speak themselves every day.

This is not to say that Analog will become a porno magazine filled with obscenities. I would not buy a story just because it has sex and street language in it. But neither will I reject a story outright for that reason. The guiding principle is realism. In most science-fiction stories, putting in a sex scene or obscene language is totally unnecessary and detracts from the story. But in some, the characters' sexual behavior is an important part of the story, or the gutter language a character uses is a vital part of the characterization.

We've heard strong opinions from the readers on both sides of this matter. But an analysis of the AnLab voting shows that sex and language problems don't really affect the outcome very much; powerful stories place highly, no matter how much or how little sex and foul language is in them. (Incidentally, it wouldn't hurt if more readers made their feelings known by voting in the monthly Analytical Laboratory poll. All you need to do is send in a postcard with the stories in the current issue listed in your own order of preference. The first-place winner gets an extra cent a word for his story, second-place winner gets a half-cent extra, and the Editor gets to know in some detail just what your tastes really are. So put *our* money where *your* mouth is!)

Let's get back to ideas.

We've all seen countless stories featuring an interstellar empire. Has anyone stopped to think of what an interstellar empire would *really* be like? Because the chances are that the only interstellar empires the human race will ever see will be in science-fiction magazines.

All political organizations have a natural limit to their size, placed on them by the speed of communications available to them. In ancient Greece, the limit of political cohesion was set by the distance a man could reasonably walk in a day: city-states. Ancient Rome, with its solid engineering and good roads made an empire that girdled the Mediterranean basin. The Mongols of the Thirteenth Century invented the pony express relay system and built an empire that spanned Eurasia from the Sea of Japan to the Danube.

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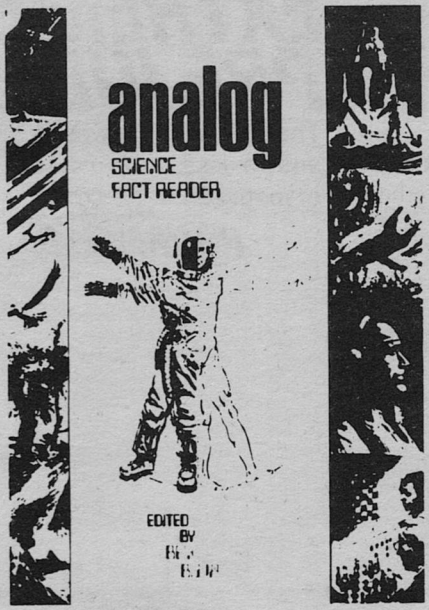

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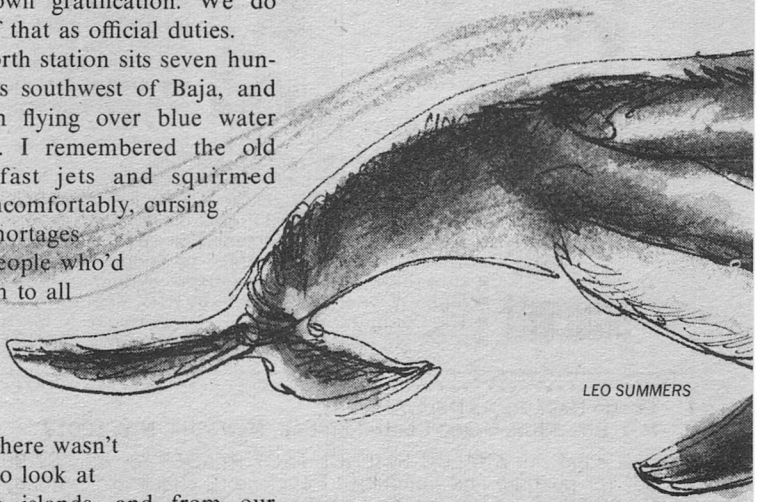
EXTREME PREJUDICE

The difference between a shark and an assassin is a matter of motivation. **JERRY POURNELLE**

There were only nine people on the airplane, but the stewardess forgot to serve me coffee. I should have been flattered. In my job, being inconspicuous is an important talent; but I hadn't been trying to be invisible, and it infuriated me. By the time we were six hundred miles southwest of the southern tip of Baja California, I'd made a scene and the girl wouldn't forget me, ever.

I was ashamed of myself long before it was over. The whole point to my job is to make the United States a better place to live. We've no business spreading unhappiness for our own gratification. We do enough of that as official duties.

Dansworth station sits seven hundred miles southwest of Baja, and we'd been flying over blue water for hours. I remembered the old days of fast jets and squirmed around uncomfortably, cursing the fuel shortages and the people who'd lit a match to all that oil. There wasn't anything to look at below, no islands, and from our cruising altitude I couldn't see waves or whitecaps. There was just that deep blue and the steady rumbling whine of the engines to



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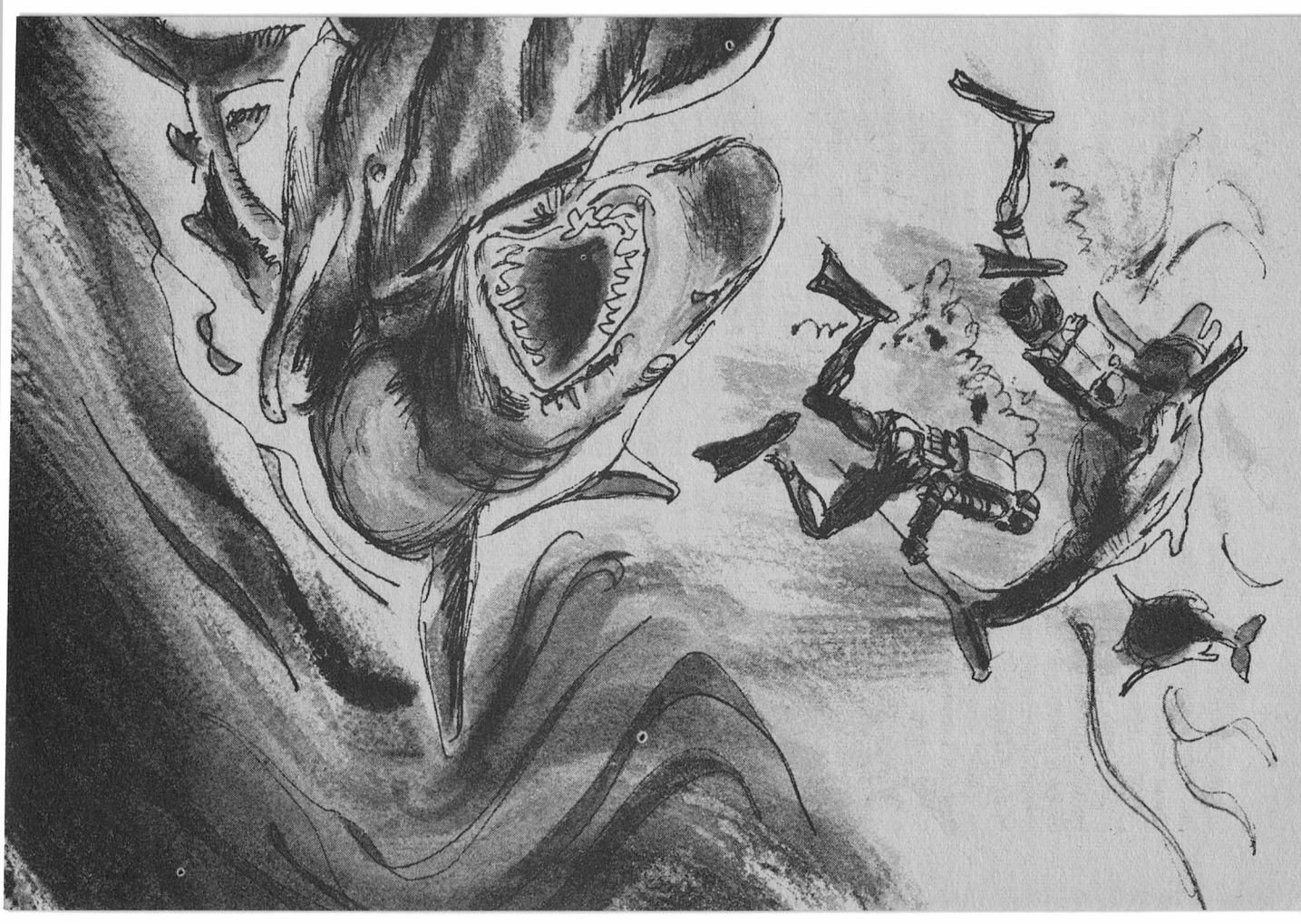


lull me toward sleepiness but keep me from sleeping. Then the water changed color.

It was many shades of blue, and green, and red, and yellow, all boiling up blue-white in the center of each patch and then the colors spreading outward in great streaks. Most of Dansworth is under water, so those enormous color patches were all I could see.

The plane circled lower as the stewardess, still not looking at me, gave her little spiel about seatbelts and having a pleasant trip. There was an airstrip floating in the water. It wasn't very wide, but over three thousand feet long, and there were buildings along its sides at the lee end. A dirigible mooring mast floated on its own platform not far away. The plane rolled to a stop at that end of the runway.

A regular grid of concrete domes dotted the sea around the airstrip, and farther away were big floating docks. A couple of newly painted oceangoing ships were alongside. The whole place was clean and bright, different from any city I'd been in recently. Somehow the new planned cities, the "arcologies," never seem to look this bright and new; but we're getting there. We have to.

Dark kelp patches grew between the isolated domes, and the water was so clear that I could see platforms about fifty feet below the surface. Silvery torpedo-shapes flashed through the kelp, and sailboats cruised among the domes, their bows throwing up white spumes as they raced with the wind. They didn't have the look of yachts. Just a means of transportation.

Dr. Peterson himself was there to meet me. I strutted a bit for the benefit of the other passengers, and the stewardess looked worried, as she should have. Ignoring passengers who rate a planeside meeting from the civilian director could get her into a lot of trouble, and jobs are pretty scarce. She wasn't wearing any rings, so she was reasonably safe from the new "One Job Per Family" program, but I understand the Federal Employment Commission is looking into that, too. Married women voters don't appreciate single girls who have jobs when there are still many families with no job at all . . .

Peterson wasn't wearing anything but a pair of shorts and a wide-brimmed hat, and he looked at my lightweight drip-dry suit with sympathy. I've worn it on so many assignments that it seems like an old friend, and even in hot weather I'm comfortable in it. I thought I'd lost it once when Hertzog's blood spurted all over me, but it washed out all right. I've never got any of my own on it, maybe that's why I like it. A good luck charm.

I was surprised at how cool it seemed there in the tropic mid-afternoon. The sun was high and bright overhead, the sky impossibly

blue with only tiny white fleecy clouds scudding across. I haven't seen a sky like that since I last went hiking in the Sierras. Yet, despite the hot sun, the west wind was cool.

Peterson had a tan like old leather. So did everyone else moving around the floating airstrip. It made me feel that I must look like something that had crawled out from under a rock. A part of me said that might not be too bad a description, and I thrust it away. It's bad enough getting doubts in the middle of the night; I can't afford them in bright daylight. I wondered if that was what happened to the man I'd come to see.

Dr. Peterson had a funny habit of brushing his beard with the tips of his fingers, the way a man might test a wall to see if it had fresh paint. He had no mustache, and I found out later that few people at Dansworth do, although beards are common. Mustaches get in the way of your diving mask. They cause leaks.

I shook hands with Peterson and walked over to the edge of the airstrip to look down into the kelp. I hadn't expected anything like that in the middle of the Pacific, and I said so. "It only grows in cold, shallow water, doesn't it?" I asked.

"Right." Peterson seemed pleased that I knew that much. "That *is* cold, shallow water, Mr. Starr. The kelp's anchored to platforms below the surface, and the water's pumped up from the deep bottom. The kelp is brought in from all over the world so we can experiment with different varieties—the stuff right here comes from the Los Angeles area."

I couldn't look away. The water was clear, and millions of fish swam in the thick kelp beds. There were long, thin, torpedo-shaped fish with bright blue stripes down their sides, moving dartingly in schools, every fish turning at precisely the same instant. Each thick clump of kelp held a brilliant orange damselfish warily guarding its territory. There were a few sea urchins among the kelp, and as I watched, a swiftly moving shape darted past to snatch one—an otter, I thought.

A school of dolphins played among the fish. Two detached themselves from the rest and came over to examine me. One rose high on his tail, lifting himself out of the water to stand there churning while he splashed water on me. I ducked back in alarm, but it was too late. I was dripping wet.

Peterson clucked and whistled, then shouted, "Jolly! That's not nice."

The dolphin whistled something, and then, garbled but clear enough so I could understand it, it said, "Sorry, boss." And laughed.

Peterson was still trying to explain when we got to Admiral Kingsley's office.

"They've always been able to

imitate speech," Peterson said. "The stories about dolphins talking and singing go back to classical Greek times. But nobody ever took the trouble to systematically teach them before."

"Yeah, well, look," I protested, "we get stories about intelligent fish all the time. Used to take 'em pretty seriously, and I know how useful the dolphins are. But does that thing understand what he's saying?"

"They aren't fish," Peterson said.

"OK. Cetaceans. Toothed seagoing mammals. They breathe through lungs, and they've never been known to attack a man, and the Navy and fishermen have been systematically using them as messengers and herders since the Fifties anyway. I've had the standard briefing, Dr. Peterson. But nobody told me the damned things could talk!"

"Not many can," Peterson said. "At least not so that an untrained man can understand them. Tell me, Mr. Starr, do you speak any foreign language?"

"Yeah." It was safe to admit that. I wasn't about to tell him just how many I could get along in. He wouldn't have believed me anyway.

"And was it difficult to learn?"

"Sure."

"Well, to a dolphin, any human language is much more difficult. You'd find it easier to learn Urdu or Yakut than Jolly did to learn English. Dolphin grammar isn't like any language we speak. Couple that with the fact that he has to suppress over half the frequencies and sounds he normally makes to communicate, and maybe you'll appreciate why so few dolphins ever manage to be understood."

We'd reached the admiral's office ten fathoms below the surface, and the conversation trailed off. There was a watertight door to the office, and a Navy yeoman as receptionist. Admiral Kingsley didn't have a beard, and his tan looked pasty, as if he'd been out of the sun for a while after a long stint outdoors. I was told he'd just come up from a seven-week tour of duty with the deep mining operation below Dansworth.

The pallor bothered me. I'd had one like that myself after the worst assignment I ever drew. The FBI caught an economic saboteur and put him away at Lewisburg. Our director decided he knew too much and would probably be exchanged, so they sent me in after him. I tagged him in two weeks, but it took another six to spring me, and by the time I came out I looked like a slug. I felt like one, too. Ever since then, I've been sure prisons don't rehabilitate anyone. Problem is, what does?

"This is Gideon Starr," Peterson said. "Admiral Kingsley."

We exchanged pleasantries and Kingsley offered drinks. I took mine and sat in a big government-issue easy-chair, the kind they have

in the Pentagon, or at Langley. It seemed like an old friend.

"Mr. Starr," said Kingsley, "you've got real pull. We've never had a visitor here with an endorsement like yours, from the Secretary."

And if you're lucky you won't again, I thought, but I said, "Well, it's getting close to budget review time. A few enthusiastic articles wouldn't hurt your research appropriation."

He smiled at that, and Peterson practically beamed. "That's a fact," Peterson muttered. "Actually, if they'd just let us keep some of the profits we'd be all right. How many research efforts actually make money?"

I shrugged. "I'll do my best, anyway."

Kingsley beamed this time. "Well. We're to show you around and then let you direct yourself," he said. "Orientation'll take a while, though. There's a lot here, Mr. Starr. And a lot of ways for a man who doesn't know what he's doing to get killed."

"Yeah." There were a lot of ways for a man who did know what he was doing to get killed, too. Most of 'em had been tried on me at one time or another. "I've got a diver's card, and some underwater experience," I said. "I think I know what to look out for."

"It's a start," Kingsley agreed. "Well, you may as well begin sightseeing." He reached out to his desk console and pushed a button. Curtains opened on the wall behind him.

There were artificial lights as well as the sunlight filtering down to this depth. Big fronds waved in slow motion, an underwater forest just outside his office. I could barely see the grid that held the kelp below us. There were shelves sticking out of every structure and shaft, and lots of shafts. Coral in bright reds and blues grew from the shelves, and barnacles, and shellfish—there and on long lines that dangled down from the surface. Fish darted through the kelp fronds. It was a dynamic color picture that'd never come through on a TV screen. I couldn't wait to get out there in it, and I told them so.

They exchanged grins. I expect every tourist says the same thing. If anybody could visit that place and not want to get outside, he was dead or might as well be.

"Yes. Well, perhaps first an orientation tour?" Peterson said. "I really don't know how familiar you are with what we're doing here at Dansworth."

"Not at all," I told him. "I'm primarily an aerospace writer. I've done some diving, but not much serious study of seapower stations. You'd better assume I don't know anything at all."

The nice part about it was I was telling the truth. Not all of it, but no lies.

The admiral hit another button

and more curtains opened. There was a 3-D map behind them, a holograph tank, and by manipulating his desk console he could show things at different levels. He started with the bare floor of the Pacific. It was crosshatched with very regular lines, a checkerboard of racks in the bottom, and about sixteen thousand feet deep. Dansworth Seamount rose steeply from the floor to within seven hundred feet of the surface. It stood there all by itself, with nothing around, at least not on that map.

"Dansworth," Peterson said. "The deep gash next to it is Shatterton Fissure. The geologists are having a field day here."

"Um." I wasn't really interested in the geology. The theories change every year, so what's the point in studying up on them? I like technology, though, and I'm a pretty good writer. I think I could make a living at it even if Langley didn't use influence to get my stuff placed in important magazines. I'll never find out, of course. You don't quit in my job. I didn't want to, anyway.

Kingsley did something to the console and the scale changed to show only Dansworth Seamount and a little area around it. A grid appeared, a 3-D chessboard, with part of the grid below the top of the mountain, and the rest above that going on to the surface. "Dansworth Station," Kingsley said. "Our city in the sea."

"Impressive." I meant it. "What's the grid?"

"Corridors, mostly. Concrete cylinders strung together. Labs, quarters, processing plants."

The place was big, and they had color codes on the different structures in the map. It would take a long time to learn everything, but I wouldn't have to. We'd found the traitor after five years, and I wouldn't be here long at all. It seemed a pity, because Dansworth was a very interesting place. I wondered what it would be like to live here.

"Now for your guide," Dr. Peterson said. "I understand you asked for Hank Shields. Any reason why?"

I shrugged. "A couple of sailors in San Diego told the editor he was a good man who knew a lot about Dansworth. Anybody else would do, if it's inconvenient."

"No, nothing like that," Peterson said. "Just that Hank doesn't want any publicity. Something about his wife. He'll be glad to show you around if you won't put him in the story."

"Suits me." I needed to think that one over, and cursed the damn fools who'd asked for Shields in the first place. I like to plan my own operations, and I don't need help from the goddam deskmen. I'll take their orders, but I don't need them trying to run my life. "When do I meet him?"

Hank Shields was about five-eleven, a good three inches shorter than me, but he weighed nearly as much, one hundred and ninety pounds. He matched the description perfectly: blond, blue eyes, thick matted beard like most people have at Dansworth. Except for the beard he hadn't made any attempt to change his face. The pictures at Langley might have been taken last week, once the artists had airbrushed the beard.

He looked me over carefully, then we shook hands and stood there sizing each other up. I looked to see anything in his eyes—recognition of my face, or my name, but if he'd ever heard of me he was pretty good at hiding it. That didn't mean anything, of course. So was I. He had a powerful grip, as good as mine, and that figured too. He'd had my job once. Finally we let go and Peterson waved us out of the admiral's office.

"What would you like to see first?" Shields asked.

I shrugged. "Better let you decide, Mr. Shields."

"Hank," he said automatically.

"Fine. I'm Gideon. Where we going? I can't wait to get outside."

"We'll spend today on the inside tour and go out tomorrow. OK?"

"Sure." As we talked he was leading me through the maze of corridors. There were watertight doors at intervals, some open, some closed, and we'd have to stop and open them, step through, and seal up behind. The corridors were about ten feet high, rounded on top, and rough inside. He pointed out various laboratories as we passed.

"How long does it take to learn your way around here?" I asked.

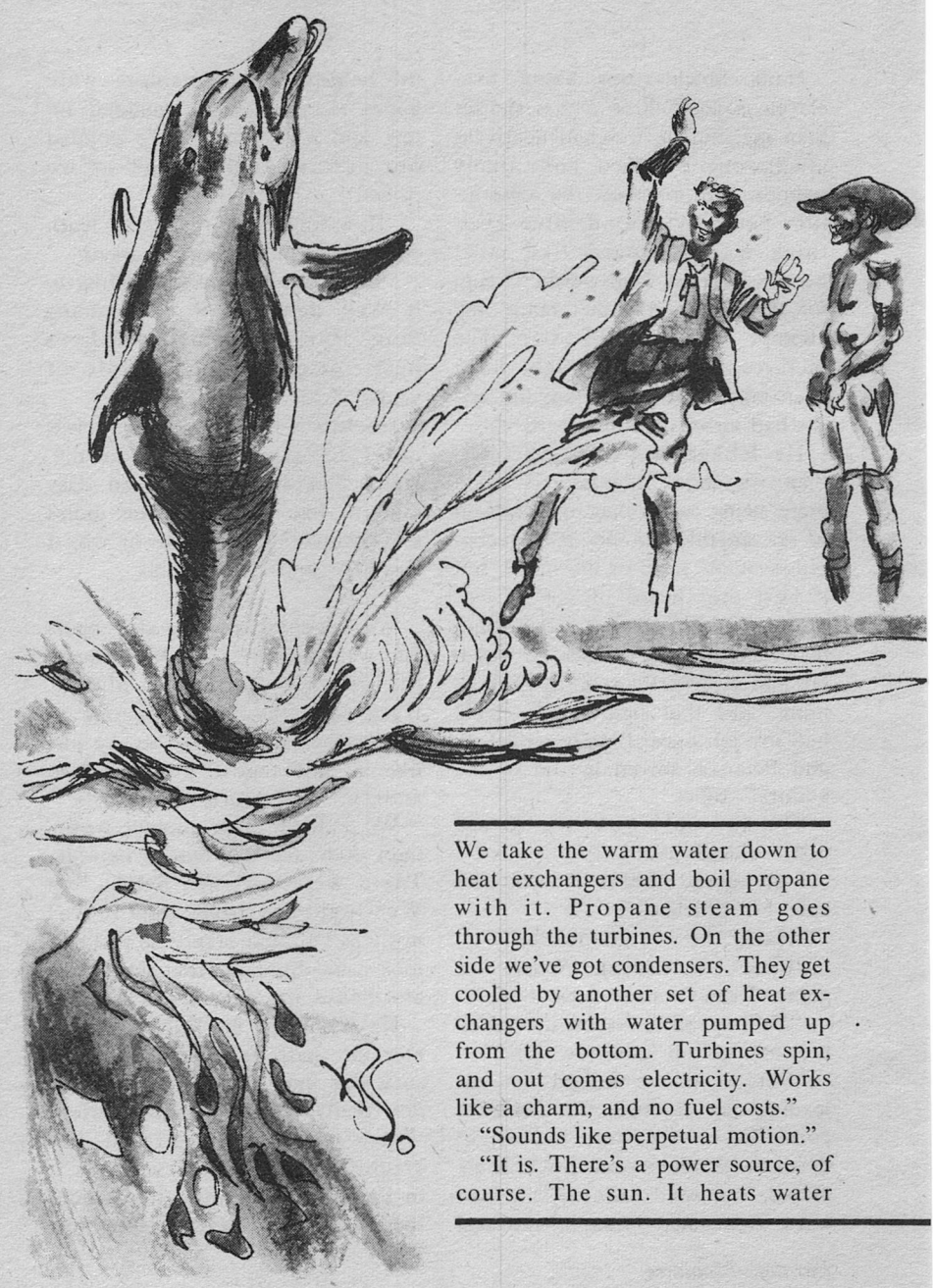
"Years. And they keep adding to it. Well, they used to keep adding to it," he caught himself. "Budget's been rotten the last couple of years."

He had a hearty voice, and was eager to explain things to me. Hank Shields would be an easy man to like. I decided he didn't know anything about me or why I was here, and I could relax.

We reached an elevator shaft and went down. "I'm taking you to the number-one power plant," Hank said. "It's the only one at sea-level pressure. The rest are just like it, only they're pressurized to ambient. Saves construction costs."

We went through another watertight door and out onto a catwalk. There were turbines below, big Westinghouse jobs, and it was noisy as hell, but otherwise it didn't look a lot different from the generator house at a dam. I said so.

He motioned me back into the elevator shaft and closed the door so it was quiet. "It isn't any different, really," he told me. "Surface water, twenty-five degrees Centigrade. Seventy-seven if you like it in Fahrenheit. Down at the bottom the water's five degrees Centigrade.



We take the warm water down to heat exchangers and boil propane with it. Propane steam goes through the turbines. On the other side we've got condensers. They get cooled by another set of heat exchangers with water pumped up from the bottom. Turbines spin, and out comes electricity. Works like a charm, and no fuel costs."

"Sounds like perpetual motion."

"It is. There's a power source, of course. The sun. It heats water

pretty good in the Tropics. What it amounts to, Gideon, is that we have a temperature difference with the same power potential as a ninety-foot water drop. Lots of dams with a smaller pressure head than that. And we've got all the hot water we could ever want."

"Yeah, OK." We started up in the elevator. It sounded impressive as hell but there hadn't been anything to see. "Just a minute. The water by the airstrip was cold."

"Right. That's used cooling water. We dump it high because it's full of nutrients. Artificial upwelling. You know, like Peru? Over half the fish caught anywhere in the world are at natural upwellings. We've made our own. Lot of profit in fish, fish meal, frozen fish, gamefish, you name it."

I could appreciate that. With meat prices where they were in the US, we're getting to be a nation of fish-eaters anyway, and Dansworth supplies a lot of the fish. "But where do you get the hot water, then?"

"Bring it in from up-current of the station, where there are black platforms below the surface to help get it hotter. No problem. It has to be pumped anyway. With dolphin-hide liners on the pipes, it's about as easy to pump the water a long way as a short."

I gave him a blank look. "I must be dense—dolphin hides? You kill them for that?"

He laughed. It was a real long laugh, hearty, and after a second I joined in because it was infectious, even if it was obviously on me. "What're we laughing about?" I asked him.

"Dolphin-hide's a process name," Hank wheezed. "You'll see. We've got a way to duplicate the effect that dolphins use to control water flow across their skin. They get true laminar flow, if that means anything to you."

I nodded. It did, just. "Smooth water flow, no friction."

"Yeah. We haven't got it worked out for boats yet, but we're trying. Easy to make it work with steady flows, like pipes. You'll see tomorrow."

We toured the station. Fisheries, where they used graded nets to catch fish at just the right sizes and let the others through. There were dolphins involved in that too. They chased the fish into the nets. The men in charge used little boxes with keys to play dolphin-sound

tunes and direct their partners. The dolphins seemed to be having more fun than the men, but nobody was working very hard and I could see a lot of grins.

In another place they had plant-research farms. Different kinds of kelp and other seaweeds, and different creatures living in them. Shrimp, fish, shellfish—anything that might be edible, and some that weren't. Everything grew like crazy, and Hank said it was because of the nutrients in the water they brought up from the bottom. "Infinite supply of that, too. All free since we need it in the power plants to begin with."

We took an elevator to the surface at the downwind end of the airstrip, and watched the big ships loading up at the floating docks. I asked how they'd survive in storms, big structures like that exposed to the waves.

"They wouldn't," Hank said. "So we sink 'em if there's a big enough blow coming. Ships stay way the hell away unless there's good weather. We get good predictions from the satellites."

It was a whole new world. Everything was bright and clean. The shops along the airstrip had no iron bars or reinforced doors. I hadn't seen a policeman since I arrived. Hank told me the Navy Shore Patrol did all the policing they needed—mostly drying out sailors who'd had one too many.

I'd never known people could live like that. Why can't we, back in the States? One day we will, if we can hang on long enough.

We went through hydrogen plants, where they electrolyzed water into its parts and liquefied the hydrogen and oxygen. The compression and electrolysis made heat, and they pumped that back into the system with heat exchangers. No stage of the Dansworth operation was very efficient, but overall it was fabulous. I knew the hydrogen was important to California, where they pipe it through the old natural gas pipelines and people burn it in floor furnaces and stoves.

"We're starting to get salable quantities of metals out of seawater, too," Hank said. "That wouldn't be economic if it was the only reason for the system, but we pump a *lot* of water through here. Power's free except for building the equipment to get it." He went on about Dansworth and how it was the wave of the future until he stopped suddenly and grinned.

"I'm an enthusiast," he said.

"I've noticed." I grinned back. "You're making me one."

"Yeah. Now let's go home and have dinner. Judy's expecting you to put up with us while you're here."

"Well, I'll be all right at the VOQ. Wouldn't want to put you to any trouble."

"Crap. No trouble. Only problem with Dansworth is we don't get many visitors. There's three thou-

sand people here and we know every one of them, or it seems like it anyway. Judy'd kill me if I didn't give her a chance to hear the latest gossip from the States."

"Yeah, I suppose—look, you're sure it's no problem?" I wasn't being polite. My father had a big thing about hospitality. It was about the only thing my father taught me that I hadn't sacrificed to the job; but Hank gave me no choice, just as the job gave me no choice. No choice at all.

Judy Shields was a willowy brunette, thin but with muscles. She had an aristocratic look and the same deep tan everyone seemed to have, but the effect was partly spoiled by freckles on her nose. My kid sister had freckles like that, and she hated them. I can remember her making unhappy sounds at the bathroom mirror while the rest of us waited outside for our turn. A rapist finished her on her eighteenth birthday.

Judy Shields was happy to meet someone from Outside, as they called it. I also got introduced to Albert Shields, age nine and called "Hose-nose" for no reason I could understand.

"Mr. Starr's a science writer," Hank told the kid.

"Sure! I've seen some of your books, Mr. Starr. You going to put Dad in a book?"

I lifted an eyebrow and looked at Hank. "According to Dr. Peterson, your father doesn't want to be in a book."

"Aw, why not? I'd sure like to be in a book. Jimmy Peterson's father's in a lot of books, and he'll never let you forget it, either."

"Off to your room, Hose-nose," Judy said. "Out, out, out."

"So you can drink, huh?" The kid winked and went out.

"He's got a point, you know," I said. "A little publicity never hurt anybody's career." I looked over at Hank with complete innocence. It seemed like the right thing to say. He looked back helplessly.

"It's my fault, Gideon," Judy said. "My family never wanted me to marry Hank. It's—well, it's all very unpleasant, and I'd rather they

didn't know we were here, that's all. I suppose it would do Hank some good to be written up."

"Not as much as that, and by damn I don't need your mother dropping in for a visit," Hank said. He poured me another drink.

"Well, forget it, then." I hoisted the martini. "Here's to Dansworth. It's quite a place."

It was, too. Although we were a hundred feet under water, the Shields' apartment wasn't small or gloomy. There was a big window looking out just like the admiral's, and the same unending color swarms of fish around the coral. Inside, the walls were concrete, and they'd hung them over with woven mats, needlework tapestries, pictures, and the like. There was a shelf of books on one wall and a shelf of ship models on another. It was nothing like homes in the States where the TV dominates the room. You could tell that the people who lived here liked to talk, and read, and do things together.

"We like it," Judy said. "Now. What's the latest gossip? Is Gregory Tolland going to hang on as President? Whatever happened to Aeneas MacKenzie?"

I shrugged, and told her what the press people were saying. "MacKenzie's gone off to Baja. Probably joined up with Hansen Enterprises," I told them. "And they say Tolland's going to hang in there. The press supports him—don't you get any news here at all?"

"Very little," Judy said. "We like it that way. No TV, and we don't read the Stateside papers. Is it true that MacKenzie found Equity Trust people in the White House itself?"

"It looks that way." I didn't really want to talk about it, although I suppose half the people in the country were having the same conversation at just that moment. Usually Agency people have about as much interest in politics as they do in Donald Duck, but some of us really thought Tolland and his People's Alliance would put some new pride into the United States. He'd started off well, and certainly MacKenzie's investigations had cleaned up a lot of dirt accumulated in Washington for thirty years. We'd helped in that. And then MacKenzie got too close to the White House, and he was out, and Tolland sat there alone in the Oval Office. "The consensus is that President Tolland was as surprised as anyone. At least the press thinks so."

Hank laughed unpleasantly. He clearly didn't believe it. Maybe he was trying to justify something, like running out.

"I'd rather talk about Dansworth," I told them. "Hank, you never did tell me what you do here."

"I'm a generalist. Sea-farming methods, mostly. Some clumsy engineering. Diving—academic training's not worth a hoot compared to just getting down there and fooling

around. We've still got a lot to learn."

"Do you dive too?" I asked Judy.

"Oh, sure. I have to. I'm the schoolteacher. A lot of the classes are out on the reefs."

"Isn't that dangerous for the kids?"

"A little. Traffic accidents are bad for children too. And we don't have gangs and muggings or smog or enriched white flour."

"Yeah." Paradise. There was something else about Dansworth. Everybody was doing something he was interested in. I wondered when I'd last met anybody like that. There are a lot of go-getters with the big international corporations, but they're in short supply back home.

And yet. It's my country. We *built* Dansworth. The arcology projects in the Midwest haven't worked so well, but we'll lick that too. We're finding ourselves again.

Dinner was fish, of course. All kinds of fish. There was one thing that tasted like steak, and I asked about it. "Whale?"

They all shuddered. "No, it's beef. Dr. Peterson sent steaks over in your honor," Judy said. Her throat seemed tight. Hank didn't look too good either, and I thought the kid was going to throw up. It was very quiet in the room.

"OK, what's wrong?" I asked. "Obviously I put my foot in it."

"You wouldn't really *eat* a whale would you?" Hose-nose asked. His eyes were as big as saucers. "I mean not *really.*"

"I never have, as far as I know," I answered. "But—I thought they were raising whales for food out here."

"No. That's over," Hank said. "Gideon—did you meet Jolly? Dr. Peterson's talking dolphin?"

"Sure."

"Would you eat him?"

"Good Lord, no."

"Whales may be at least as smart as dolphins. Killer whales certainly are—of course they're a kind of dolphin anyway. But even if the bigger whales aren't as intelligent as we are, they're more like apes or gorillas than cattle. They're *aware.* Would you eat monkeys?"

"I see what you're getting at." I saw it, but I didn't have the emotions they did. It really disturbed them.

"The reason we can let the children swim without worrying about them is that the dolphins watch out for them," Judy said. "We wouldn't be able to operate this place without them."

"But whales eat dolphins," I protested. "Don't they?"

"Killer whales do," Hank said. "OK. I grant that, and the dolphins have no use for their overgrown cousins. But dogs eat sheep too, until they're taught to take care of them. It's the same thing."

"You have killer whales here?"

"No. They'd be too hard to take care of," Hank said. "We're con-

centrating on training the dolphins right now. But there'll come a time—"

"And what about sharks?" I asked. "Any chance of taming them?"

"No. They're vicious and stupid, and you can't even hate them. I suppose they have a place in nature, but there's none for them here."

Hank's voice had an edge to it when he said that. I wondered if he was thinking the same thing I was. He'd been a shark, and he'd found a place here. A bloody traitor to the Agency, a man who'd run out, making it just that much harder for the rest of us.

After dinner we sat around watching the fish look in at us. They were attracted to the lights. There were dolphins too, including a baby that kept perfect station just behind and under her mother. I was told I'd meet them the next day.

Hank and Judy kept asking me about the States, and they didn't like what I told them. That didn't surprise me. Even after a few hours here, I could feel the contrast with the way we lived at home. Everyone at Dansworth had a purpose, but back home everyone seemed to be like a man hanging on to a rope over the edge of a cliff, and nobody seemed to quite know what to do about it. Until somebody does, it's my job to keep some Charlie from sawing the rope in two. God knows there are enough trying it.

They'd listen to stories about the Outside for a while, then they'd get off onto something else going on at Dansworth. Minerals. Ecological farming, fish and plants, pollution-free power, talking to dolphins. Hank was working on all of it, trying to keep track of the big picture, but there was so much going on he always had more to do than he had time for.

That's when I really hated Hank Shields. He was enthusiastic about his work. He had a wife and family. He had a job he really believed in. He slept nights, with none of those little doubts that grow and grow in the quiet darkness until you get up and turn on the lights. He had all the things I'd never have, and why should he?

He'd been one of us. He'd quit. We can't quit, but Hank Shields had tried it. Now he sat smugly in his living room, with his lovely wife, and thought about this Paradise he lived in. He thought he was safe.

He'd soon learn different.

For our first day's diving we used only masks and snorkels and fins. The water was clear, and there were fish everywhere. I was surprised to see Pacific barracuda swimming near us, and they made me nervous, but Hank said they wouldn't hurt anyone. They hardly ever did back in the States, of

course, and here they were well-fed and the vicious ones weeded out.

The dolphins did that. We'd no sooner gone off the platform into the water, Hank and me and Hose-nose, when five dolphins came around. Hank had a little box attached to his belt, and played a tune on some keys sticking out of it. The dolphins arranged themselves in front of us and I'd swear they were laughing at us.

"This is Jill," Hank said, pointing to the mother I'd seen the night before. "And the little one's Susie. Jill, meet Gideon Starr." He also made clicks and wheezes on the box.

"You telling me she understands English?" I asked.

"Quite a lot. So does Jumbo, the big male there," Hank said. The dolphins laughed again. "But none of these can speak English, at least not so that you could understand them. We're teaching Susie, but she's very young. Actually she doesn't speak dolphin very well either. She's learning both languages together."

Hose-nose was swimming around the big female dolphin, pushing Susie away from her mother. Jill turned in a tight circle, Susie following exactly, leaving Hose-nose behind and then coming up face-to-face with the boy. The dolphin chattered loudly.

"Stop it, Albert," Hank said wearily. "You know better." He turned to me. "Kids. He knows that dolphins don't like people messing with their children. Jill won't actually hurt him, and Hose-nose counts on it. Well, Gideon, you ready for a wild ride?"

Hank produced harness things, big rigid rings with trapeze bars hanging behind them. The dolphins stuck their bills into the rings, and we each grabbed a bar. Hose-nose had Jill and I drew Jumbo, while another male called 'Fonso towed Hank. We moved through the kelp beds at about five knots, with a kaleidoscope of colors flashing below us. The other two dolphins ranged around us in tight circles, charging toward me and then diving under just as it seemed a collision was inevitable. It took me a while to get

used to it, and I saw Hank watching me out of the corner of his eye, while Hose-nose was openly laughing.

I was damned if I'd give them anything to laugh about, but there were a couple of times when I held my breath. A six-hundred-pound dolphin is *big*, and when he comes straight at you moving about twenty knots—it's scary.

It was also hard to manage my snorkel at those speeds. We made enough of a wake to swamp the thing quite often, so I was pretty busy keeping my mask clear of water and trying not to inhale too much brine. Eventually Hank made more clicks and wheezes on his box and the dolphins slowed down a bit. I was sure I'd been tested, and wondered if it were standard treatment for visitors. Dudes are fair game anywhere.

I saw how the barracuda-management program worked about an hour out. We were free-swimming in kelp beds, the giant fronded stuff that grows off Catalina Island, diving down among the fish and watching sea otters collect the spiny sea urchins to take them up to the surface and crack them. One of the barracuda got too interested in an otter, and the dolphins converged around it. The barracuda realized its mistake immediately and darted off, doing maybe thirty-five knots, much faster than a dolphin, but one of the dolphins had anticipated that. It had started on a converging course before the barracuda saw him, and snap!

I began to have a healthy respect for dolphin teeth. The barracuda made a nice meal for the five of them, a tidbit apiece with Susie getting most of the innards.

Well, people keep dogs, and they have big teeth. Families will trust their babies to the temper of an Alsatian that could take the kid apart in three bites, yet puts up with being sat on and ridden . . . but dogs have been bred for that behavior for thousands of years. The dolphins are only wild animals.

Or are they? They aren't really wild, and is it fair to call anything that smart an animal?

We went out again the next morning. The Shields had a lock system so you could go out from their home, twenty fathoms down; at that depth we were below most of the kelp, although there were some giant fronds growing up from platforms attached to the deep-layer corridors and labs. A couple of sailors brought over equipment for me and got it fitted properly, while Hank and Hose-nose put on their own gear. The kid was enjoying his respite from classes, and Judy Shields was mad because she couldn't come with us. She had to teach the school her son was playing hooky from . . .

They used helmets with a faceplate that covered the whole face,

mouth and all. I'd never used that system before. The advantage was you could talk with it, and I could understand Hank a few feet away, although it was tough; but there was also a plug-in system to connect to the underwater sled, and when we were all attached to that everything was easy. There was a little garbling, but not much.

The sled was a four-man job with two pairs of seats protected by what I'd have called windscreens except that of course these were waterscreens. It was powered by batteries, and held air tanks so we didn't have to use the backpack air while we traveled around the station. When we got outside and Hank had showed me how the system worked, he used the dolphin-talker box to play a tune. Jumbo, Jill, and Susie showed up.

"We'll only need Jumbo," Hank explained. His voice sounded heavy and a little mushy in my helmet phones. "Jill's off-duty anyway, of course, because raising Susie's a full-time job. The others have work to do."

It took a little while for our eyes to get accustomed to the light down that far, and I was surprised to see just how much filtered through to twenty fathoms. There weren't many reds or yellows, of course; water absorbs that end of the spectrum so that down that deep everything seems to be different shades of blues and greens.

We took the sled out to the edges of the great colored patches of diatoms and plankton that surrounded the upwelling cold water with its nutrients. There weren't any structures out here, and it was officially not part of Dansworth at all, but Hank wanted to show me the color changes. We were up to about sixty feet now, but we'd been down a couple of hours. On the way the dolphins played their game with the sled, darting ahead and then racing back to do a couple of tight turns around us, urging Hank to get up more speed.

Finally I asked Hank about decompression.

"No problem," he said. "Judy'll have the whole apartment pressurized when we get back. We'll go in and let the system take care of gradual decompression—or leave it pressurized if you want to go out tomorrow. That's one of the big advantages at Dansworth, the deep-water boys can get saturated and stay at pressure as long as they want."

"What do you do if you want to get down really deep?" I asked. As we'd cruised through the last of the experimental kelp farms a couple of miles back, I'd seen the winking lights of the mining operations far below, down at the top of the seamount itself.

"Have to use special gas mixtures," Hank said. "Expensive. Helium's gone out of sight. We use rebreather systems so we won't waste it."

"I want to try that. The editors insist on coverage of the deep mines."

"Better to use the crabs," Hank said. "Little subs. The outside gear takes a lot of training."

"I've been down with Navy gear," I told him. "And out into space for that matter. It can't be all that different."

"It is, though. Well, OK, maybe next week. Can't take the boy down there."

Hose-nose mumbled disappointment. He'd seen all this before, although he said he hadn't been this far from the station itself before, and he wanted to see the mines.

We swam around the edges of the color patches. The cold water spreading out to here made distinct layered patches in the warm tropic waters, each layer edging downward away from the upwelling point. There were different creatures in each layer, and the layers were separated by twenty or thirty feet of water. The scene was fascinating.

We were about ready to turn back when we heard a shrill whistle and a loud scream. I looked around, scared stiff, then decided it was the dolphins playing games on us.

Hank had his box out and played a series of clucks and gobbles on it. One of the dolphins answered.

"Quick!" Hank shouted. "Into the sled! Shark!"

Hose-nose moved toward the sled fast. I was confused, not knowing what to do for a second, and stayed with Hank. We swam toward the sled, and then, just beyond it, I saw the thing.

It was a big blue shark, over twenty feet anyway, and it was charging toward little Susie while Jill tried to stay between the shark and her daughter. I didn't see Jumbo at all.

The shark was beautiful. It raced through the deep water, a deadly blue torpedo, straight toward the baby dolphin. Jill would have had no trouble keeping away from it if she hadn't been worried about Susie, but now she was right in its path.

Even from forty feet away I could hear the underwater *crunch!* as the shark hit the big dolphin. Jill whirled away, tumbling and twirling, and the shark headed for the baby.

It was like watching a bad movie, all in slow motion, it seemed, although nothing was moving slowly at all. We were kicking hard to get to the sled and the shark took another tight turn and came back at the little dolphin and Hose-nose was screaming something and we couldn't get to the sled in time and even if we could I didn't know what to do—

Jumbo came from nowhere and struck the shark just behind its gills. He had come on at full tilt, seven hundred pounds of dolphin

moving at twenty-five knots, and the impact was terrific.

It didn't seem to affect the shark at all. The deadly blue shape was knocked off-course and missed Susie, but that was all. It started another tight turn, while Jumbo whirled with it, trying to get up speed and at the same time keep the shark off the baby.

Susie was making screaming clicks, and kept trying to get to her usual station behind and below her mother, but Jill was tumbling out of control and I was sure she was dead.

We reached the sled and Hank took a long lance with a slender ice-pick tip from a rack along the sides. There were other lances there and I grabbed one and followed.

"Stay with the sled!" Hank shouted. "Button her up!"

"Yeah, do that!" I told Hosenose. I kept right with Hank. He looked back for just a glance to see I was with him, a twisted look of pain and rage and thanks all at the same time.

We got to the two dolphins and took up positions on each side, lances held out toward the shark. Once we were there, Jumbo streaked off to get up momentum.

The shark didn't like the situation now. I don't know just how conscious those things are, but it had three functional enemies—none as big as it was, but all acting aggressively.

On the other hand, there was a faint trail of blood from Jill and that attracted the shark. I saw that Jill wan't dead, but she wasn't under control either. The impact had done something to her, knocked her unconscious perhaps.

The shark circled. Jumbo flashed at it, and the shark dodged in a tight turn above us, then when Jumbo was past made up its mind and started straight toward me. I kept the lance pointed out at it. It seemed that I had plenty of time, although the whole battle hadn't lasted more than a minute.

The shark was moving fast and I didn't know if I could hit it straight on. Just before it got into range of the lance, Jumbo was there again, *wham!*, striking the shark at the same place, just aft of the gills, and diverting it. As it passed overhead I rammed the lance deep into its belly.

It was a charged lance, and it should have injected a full bottle of CO_2 into the shark. I cursed when nothing happened and realized I hadn't pulled the goddam safety pin out. All I'd done was give the shark a tiny puncture wound, nothing that would hurt it at all.

It did the job, though. The shark flinched in surprise and turned slightly. Hank was right there with his lance, and he hadn't forgotten. The needle went in and there was a loud whooshing sound. The shark wriggled for a second, then started floating upward, fast, its insides blown up and compressed and

great bubbles of bloody gas coming from its mouth and gill slits. Jumbo came screaming around in another tight circle and rammed it amidships, forcing out more blood, but the monster was dead and headed topside, buoyed up by the gas injected into its innards.

Hank was still shouting. He was under the unconscious dolphin, pushing it upward toward the surface, kicking hard. Jill had neutral buoyancy; she wasn't heavy, but she was very massive, and it was slow work. I swam alongside and kicked upward, pushing at that great heavy body. She felt warm and hard, almost rigid. Susie kept swimming around us, screaming plaintively. Then Jumbo was there pushing upward as well.

"Get back down!" Hank ordered. "You'll have the bends."

"So will you." I kept shoving upward. It seemed to take forever, but the light was getting brighter.

He didn't say anything else, and after a long time we broke surface. I had managed to keep the pressures equalized and breathe out steadily on the way up, only taking in a few breaths at intervals. It would be a while before we felt anything, I decided. We didn't have any embolism problems. Or if we did, I didn't feel anything. Yet.

When we got the blowhole above water, Jill let out a long whistle of breath and started breathing again. She was thrashing around feebly, unable to keep herself above water without help. The only blood I could see was from an irregular tear just below her fin, whether shark-bite or just abrasion from the sandpaper sides of the blue shark I couldn't tell.

Hank played another tune on his call-box and Jumbo darted away from us, swimming in a big circle that kept widening before coming back and making clicking grunts.

"No more sharks in sight," Hank translated. He stuck his helmet down below the surface and shouted. "Hose-nose!"

"Yes, sir." The kid's voice was faint but we could hear it. I couldn't make out any expression in it, but I could imagine what the boy was thinking. He was well-trained, to stay down there while his father brought his friend—Jill was certainly more than a pet—up to the surface.

"Go get help. Jumbo will stay with us."

"Yes, sir." There was a pause. "Is Jill all right?"

"She's alive. Get going."

"Yes, sir."

I heard the sled motor start up, a high-pitched whine, and then it receded. We were alone up there, saturated with nitrogen and holding up a bleeding dolphin, while more sharks might come around at any moment. I thought I remembered that blues hunt alone. I also remembered that sharks can smell blood for miles.

"All right, get back down to

forty feet," Hank ordered. "Jumbo and I'll hold her up. Stay five minutes and then come up and relieve me. Your lance is still armed, isn't it?"

"Yes. OK." I let air out of the buoyancy compensator and sank slowly. It didn't need two to hold up the dolphin. At least not two men; Jumbo was doing most of the work anyway, but he couldn't quite hold Jill alone. It took someone on the other side to do that, to keep her from rotating and falling away.

The five minutes took forever, then I surfaced again. Hank made more noises on his call-box, sending Jumbo on another long patrol out around us. When the dolphin returned, Hank gave me his place. He seemed a bit gray and sweaty under his faceplate and I thought he had a touch of the bends, or an embolism, or both. The only thing we could do for that was to get him down again, and I pointed emphatically. He nodded.

"Thanks," he said. Then he sank out of sight, and I was alone on the surface.

Not really alone, I decided. There was Jumbo on the other side of our burden, and Susie just under us, still clicking and whistling but not so plaintively now. Jumbo clicked at her, and she was quiet. There were swells, about five feet high, with tiny whitecaps on them, and it was hard to hold the dolphin upright so the blowhole was above water. I kept getting saltwater into my mask and it was hard to clear. I was still on tanks; a snorkel would have been flooded. The sun was hot, but the water was only warm, friendly, comfortable except for the waves. I cursed them.

We floated there, Jumbo and I, holding up the wounded dolphin, and I thought about Hank Shields. We'd worked well together, and the only mistake had been mine. A stupid one at that. Shields had been a good man. He was doing a good job here at Dansworth. He wasn't hurting anyone; he and the work at Dansworth were helping make life better for people in the States.

That wasn't a profitable way of thinking. Shields was a goddam traitor. He'd run out on the team.

Maybe what he was doing now was more important, but that wasn't my decision.

Jumbo made more sounds at me, but I couldn't understand them. "*No comprende*," I said, then laughed at myself. For some reason I'd used a language foreign to me thinking Jumbo might know that. Of course he wouldn't understand any language I knew. Except perhaps English. "I don't understand," I said as clearly as I could.

"OK," the dolphin replied. It was quite clear and distinct. He began nudging Jill, and she responded a bit, moving her tail about to help keep herself above water. She breathed noisily. After a while she could hold herself up with only a little help. I pointed out toward the sea and made a big circular movement with my arm. "Sharks?" I called.

Jill clicked something that sounded scared. Susie clicked back.

"No. OK," Jumbo said. Again it was quite clear enough to understand. He darted away, leaving me to hold up Jill with her help. He tore off in a big circle and stayed out there a long time. When he got back he made clicking noises.

"Another shark out there," I heard. "Probably a lot of them. They'll eat the dead one first." This wasn't from the dolphin but it took a moment to realize I was hearing Hank's voice from seventy feet down. "I can't come up, I'm afraid. Can you hold on?"

"Sure!" I called. I wondered. But Jumbo was racing around us in a tight circle now, and I had my lance. I took the bright red ribbon hanging on the safety pin and pulled it out, then held the lance warily. The thing was as dangerous to humans and dolphins as it was to sharks.

I thought about the sharks. Come to blood from miles away. Eat each other. Stupid, single-minded killers. I didn't like the thought.

After a while I saw Hank rising from below. He hadn't given me any warning, and my lance was pointed slantingly downward, just where he'd come up, the point probably invisible because he'd be looking up at the bright surface and the lance was shadowed by the dolphin and her daughter . . .

It was simple. An accident, and no questions. He was swimming badly, and I was sure he was suffering, how bad I couldn't tell.

An accident. No witnesses. Terminate with extreme prejudice. He was almost to the point of my lance now. A tiny movement and he'd be a closed-file entry—

No. He was a goddam traitor, but he'd fought to keep the dolphin alive. He'd earned that much. The sharks might come back, and I'd need him. The job could come later. Right now, I wasn't risking the dolphin. It made an ironic joke, because my supervisor hated dol-

phins more than he hated Hank.

"Get your ass down there under pressure!" I shouted. "You're in no goddam condition to come to the top." I shifted the lance point so that it missed him. "And give me warning when you come up. You almost impaled yourself."

He looked at me funny. It was a knowing look, and it said a lot. I frowned. "Get below!"

He sank back down without a word. A Navy recovery boat with a compression chamber reached us about twenty minutes later, but it was only ten minutes before a whole school of angry dolphins was around us, looking for sharks to kill. They found two.

They let Hank come home for dinner. He'd suffered a painful mediastinal emphysema, but nothing permanent. We ate dinner in the Shields' apartment pressurized to fifty feet. It was a quiet dinner, and afterwards he sent the boy off to his room.

"Thanks," he said. "Don't think I could have saved Jill by myself. The babies always die if they lose their mothers, and Susie's the best prospect we've ever had. You did a good job today."

"So did you."

"I try. Maybe I'll earn my way back into the human race."

Before I could say anything, Judy came back into the room. She looked at Hank sprawled out in a reclining chair and clucked at him. A bubble had formed inside his chest cavity, and another under the skin at his neck. Recompression forced them back into solution, and now we were paying the penalty by being confined while the pressure was slowly reduced. It wasn't really a problem, since large parts of Dansworth stay under pressure all the time.

"Guess you can't take me diving tomorrow," I said.

"No. Surgeon says it'll be a week. I expect you don't want to go without me," Hank said slowly. "Be no point to it. Right?"

I looked up sharply. Judy was frowning, not really understanding. I couldn't keep from watching her. She reminded me of my sister, all right, but even more of the last girl I'd really been serious about. The one I'd driven away because of the job. It would be easy to be in love with her, and she was going to be alone pretty soon.

"We'll dive together next week," Hank said. "Can't put it off forever. If I don't take you, there'll be somebody else to show up for the same dive. Right?"

"Yes." So he understood. I wondered what had given me away.

"We're pretty heavily insured here," Hank said slowly. "The Navy pays staggering premiums, but our families are well provided for if there's an accident." He saw Judy about to say something, and continued, "So if you haven't filled out the forms yet, you ought to.

You'll be covered, be a pity if you haven't set things up properly. Morbid subject, of course. Let's change it."

We did, talking about dolphins, and about sea-farms and the power plants. And sharks.

"They adapt," Hank said. "We've tried the lot. Electric signals, noises, chemicals—nothing stops them all. But most avoid this place. The dolphins hunt them. If sharks weren't so stupid they wouldn't come around at all; but there're so many fish here, and the wastes from the processing plant can't be completely disposed of without getting some blood and guts in the water. We were up-current of that, and usually the sharks don't come there. I doubt it would have attacked us anyway, except for Susie. Baby dolphin's a tasty dish to a shark."

Judy shuddered. "I've never seen a shark attack," she said. "But Hank, you were out of your mind to take Albert out beyond the perimeter. Close to the station we've always got plenty of dolphins on patrol, but out there with just Jumbo—I wish you wouldn't take the boy out that far again."

"I won't," he said. He stood and put his arm lightly around her. "It's been a good five years," he said. He wasn't talking to anyone in particular. He kissed her. "I'm a little tired. Gideon, if you'll excuse me, I'm sure Judy can entertain you—"

"No, of course not," I said, and went off to my own room. I had a lot to think about, and I didn't want Judy's company just then. I wasn't sure I wanted my own.

They put me through a week of training before they'd let me take a deep dive to the mine sites. It was another week after that before the surgeons would let Hank go with me.

We went down in a concrete shaft that contained a series of elevators. Every hundred feet we'd have to get out and pass through a pressure-tight door. Not only did the pressures change at each depth, but the gas mixtures as well, and at the third we had to put on our hearing aids.

They weren't really hearing aids, of course. They were tiny computers and electronic speech-filtering devices. The gas mixtures that let men live at the lower depths and higher pressures contained a lot of helium, and a man talking in a helium-oxygen mixture sounds like Donald Duck. Some of the old-timers could understand each other without hearing aids, or claimed to, but most people couldn't make out a word.

The hearing aids take that gobble-gobble and suppress some of the frequencies while amplifying others, so that the result sounds like normal speech in a flat monotone. It's impossible to get much expression into a voice, but you can be intelligible.

We went on down until we were at the lowest level, seven hundred and eighty feet below the surface. There was a large structure there, with laboratories and quarters for the workmen, mostly Navy people.

It was also cold. They heated the structures, and they had plenty of power to do it with, but helium conducts heat better than normal air. You feel heat losses and feel them fast. When we went outside we'd need heated wetsuits too. The water at that depth is quite cold.

The first couple of days we took it easy, going out with a gang of Navy men to watch the mining operations. They were just getting a good start, sinking shafts into the sides of the seamount, taking samples for the scientists as they dug. Everybody was excited about what they were learning. This was the United States' first chance to catch up with the big international corporations who had a big edge in undersea mining technology.

On the third day we went out alone. It was dark and gloomy except where our lights pointed, and there were ghastly streaks of phosphorescence everywhere. It reminded me of some big city, deserted at night, and it had the same air of undefinable menace. The dolphins couldn't come with us, although Jumbo and 'Fonso were overhead, and once in a while one or the other would dive down to our level, chatter at Hank for a second and get a reply from his belt call-box, then head back topside. The depth was extreme for dolphins, Hank said, and although they were breathing surface air rather than high-pressure stuff as we did, so they could go up and down without decompression problems, at that depth nitrogen will go into solution quite rapidly; the dolphins had to watch out for embolisms and bends themselves.

It wasn't quiet down there, and we weren't alone. There were hundreds of tiny clicking sounds, which I didn't understand until Hank took me to the seamount itself and I saw little shrimp, or things that looked like them, scuttling along on the bottom. They made snapping noises with their pincers.

There were also eel-like things, not very large, and strange-looking fish, also small. The real deep-bottom monsters are much farther down, of course, down where men can't get at them without bathyscaphes and protective equipment; but these were strange enough. There was one thing about seven inches long, dark blue in the yellow-glaring lights, and it seemed to be all teeth and eyes. I'm told it can swallow fish larger than itself.

Nothing seemed interested in us one way or another. We could get quite close to the fish—not that I'd want to touch any of them. It was a fascinating scene, but a little scary, and the knowledge that anything going wrong with the gear

would kill us instantly didn't help. I don't like situations where I have to rely on equipment some unknown tech has made.

We swam around the bottom until we were out of sight of the station lights and mining operations. The top of the seamount was fairly flat, and rocky, scoured clean of mud, with small pebbles between the larger rocks. Even down this far were anemones and barnacles with feathery flowers waving gently in the current. Once in a while larger fish up to a couple of feet long would cruise by. I kept watching for squid or octopus but I didn't see any.

There was a light well ahead of us and Hank waved me toward it. We cruised gently along, conserving energy. The rebreather apparatus didn't even leave bubbles behind, and despite our lights nothing paid much attention to us; I began to feel like a ghostly intruder, unable to affect anything, an observer in a plane of existence I didn't belong to.

The light turned out to be a shelter. It was a hemispheric dome held up from the bottom on stilts. The hatchway underneath swung upward and opened at a touch. We came up inside a space about thirty feet in diameter and fifteen feet high. Cabinets lined the walls, and there were more lockers under low benches. Plexiglass windows looked out onto the seamount and its surprising inhabitants.

The shelter was heated, and we could disconnect our batteries. I took a seat and gratefully removed the scuba gear with Hank's help. Then he was taking off his own, his back toward me, and I had the long shark dart, safety still on because I didn't want him to float. I aimed it just under the diaphragm and my hand wouldn't move.

He finished taking off his gear and sat across from me. We didn't say anything for a long time.

"It's not going to do either one of us any good," he said finally. "Why the hell don't you get it over?"

"Get what over?"

"I've had you made out since you came here. Gideon Starr. Science reporter able to move around and interview almost anybody—great cover, Gideon. I knew about you before I left the Agency."

"I see. They don't know that, back at Langley." I watched him warily now. We couldn't just leave here and go swimming again, not with it out in the open like this.

"I thought they might not. I can't run, you know. Where could I go? And I'm sure your people are watching the transports."

"Humph." I didn't say anything else but he knew what I was thinking. Anybody as good as he was couldn't have any trouble outwitting gate-watchers.

"Yeah. OK, I'm tired of running. I like it here, Gideon. And

what good does it do Judy? That how you spotted us? She's not too good at this game."

"No, it was the dolphins," I said. "Turner. You remember Turner?"

He grimaced. "Sure. Holier than thou. America for the Good Americans, whoever the hell they are. I think he likes termination orders. What's he got to do with this?"

"He hates dolphins," I said. "Afraid they'll replace people or something. Reads everything he can find on them. Something he read made him wonder if you were out here at Dansworth. I don't know what it was, but he had Plans take a look. *Then* we spotted your wife."

"I see. Yeah, there was a *Science* article that might have given me away, but I didn't think anybody in the Company would read it . . ."

"He did. And really got mad. Double traitor, he called you. Traitor to the Agency, and traitor to the whole human race. Not that the dolphins made any difference, Harold Braden. OK, you cut and ran. There's a few get away with that. But not when they warn their subject first. We can't allow that, Braden." I shifted the shark dart in my hand, turning it over and over, wondering what would happen if he decided to fight. He was nearly as big as I am, and he'd been a good man in his day. But he was out of training, and he seemed to have given up.

I had to remember that a man hasn't really given up until he's dead. Not a real man.

"Call me Hank," he said. "I killed Harold Braden five years ago. Did they tell you who the subject was? The man I warned?"

"No."

"Aeneas MacKenzie."

I whistled. It didn't come out as such; the hearing aids weren't designed for that. The whole conversation had an eerie quality, as we talked of life and death in flat monotones. "MacKenzie. Greg Tolland's manager. If you'd got him, Tolland wouldn't have been President . . ." I thought for a moment. Five years. "It was *after* the election! Tolland's orders!" Again the exclamation points didn't come through. All Hank could have heard was another monotone.

"Yeah. I know."

But I'd believed the story. Tolland made Aeneas MacKenzie his Solicitor General, and MacKenzie found graft and corruption all through Tolland's People's Alliance. It had nearly destroyed President Tolland, but we all believed he hadn't known any of it until MacKenzie uncovered the mess . . .

Only Tolland had ordered MacKenzie terminated with extreme prejudice before he even started his investigations.

"You know MacKenzie's gone over to Hansen Enterprises?" I asked.

"You told me." Hank kept

watching me, and every now and then he'd look away, out the windows, to watch the fish and shrimp cruising past; and when he'd look back again, he did it with surprise that he was still alive. "I guess it figures. Laurie Jo Hansen never had much use for Greg Tolland to begin with." He laughed. The hearing aids made it come out "Ha, ha, ha," and a snort. "Funny. We always thought the big corporations were the enemy."

"They are. You know how they work."

"Sure. How do we work?"

"It's different. We have no choices. We're soldiers. How else can the people fight that kind of power? Don't play games with my head, Shields. It won't work."

"Didn't think it would. You can't admit you're wrong. You've spilled too much blood for the cause. Admit you're wrong and you're a monster. I know, Gideon. I *know*."

We were quiet for a while. Finally I said, "Hansen's got a setup like this in the Sea of Cortez. Experimental. Not full production scale."

Hank nodded. "Pity I didn't run to her in the first place. You'd have had your problems getting to me. Too late now. Not even Hansen could keep your people away from me. Not forever. And I'd always come out in the open if the family was involved . . ."

Family. I thought about Judy. She'd be alone soon. And that was stupid, because I'd always be alone. "Nobody'd look for a dead man."

I don't know why I said that. In my business you do your job and that's all. Hank was right, you can't question your orders. If the people at the top don't know what they're doing, if it isn't worth it, what are you? A goddam hired killer, a criminal, and I'm not that, I'm a patriot. A soldier.

Hank gave me another funny look. "If you report me dead and I turn up again—"

"Yeah." If that happened, I was meat. I *should* be. One day I'd find myself across a room from somebody like Gideon Starr. Get it over, my mind said. Hank was looking out the window again. One quick thrust. Or the right blow, and push him out without the scuba gear. Without the gear he'd go straight up, and nobody had ever survived a free ascent from these depths. He'd float, lungs ruptured, embolisms all through his blood and brain. Quick, painless, and easy to explain.

And I knew I wasn't going to do it. "If a man bought it with his gear on down here, he'd go right to the bottom," I said. "No way ever to find a body."

"But he'd have to leave Dansworth. You think I'd get past your people?" He turned to face me again, but this time he didn't look surprised. Just tired. "I told you, Gideon, I killed Harold Braden. Hank Shields doesn't let his

friends trade their lives for him."

"Friends?"

"By me, yeah." He didn't say anything else, but I remembered how it was with the two of us swimming Jill to the surface, watching for sharks, waiting for the flash of pain in the head that signals embolism, or the crippling stab in the joint from bends . . .

We sat there some more, thinking. "If you got to Hansen's outfit off the Baja coast, you'd be OK," I said finally. "Seven hundred miles. Open water. Don't dolphins go that far?"

This time he really looked at me.

"There are spare air bottles in here, aren't there?" I asked. "Air and helium-oxy? Enough to let you decompress? And you've got the call-box. Trust the dolphins to take you seven hundred miles?"

He thought about it. "We'd make about ten knots. Three days. Warm water." He started rooting around in the lockers and came up with canteens. "Fresh water. I won't need food. The dolphins can catch fish, and a man can live a long time on fresh raw fish. How'll you expalin the supplies missing from here?"

"Who's to know we were ever here? I'll have good stories, for the Navy and for the Agency. You're down in that muck, in five hundred fathoms."

"You're crazy. They'll watch Judy. I have to send for her, Gideon. When she comes to Hansen's outfit, they'll suspect. Then we've both had it."

"They won't bother with her. Not if you're dead."

"Why, Gideon?" he asked.

"Get the hell out of here. Just do it." Please. Before I change my mind, before I get my sanity back. For God's sake, Hank, go . . .

He put on the scuba gear and gathered up water bottles. Then he made a neat towing package of the other stuff, heli-oxy bottles, and some pure oxygen for when he got closer to the surface and wouldn't get oxygen poisoning. He could stay down a long time with those. Much longer than the decompression time he'd need. If there were storms, he'd just go under. The dolphins would take care of him.

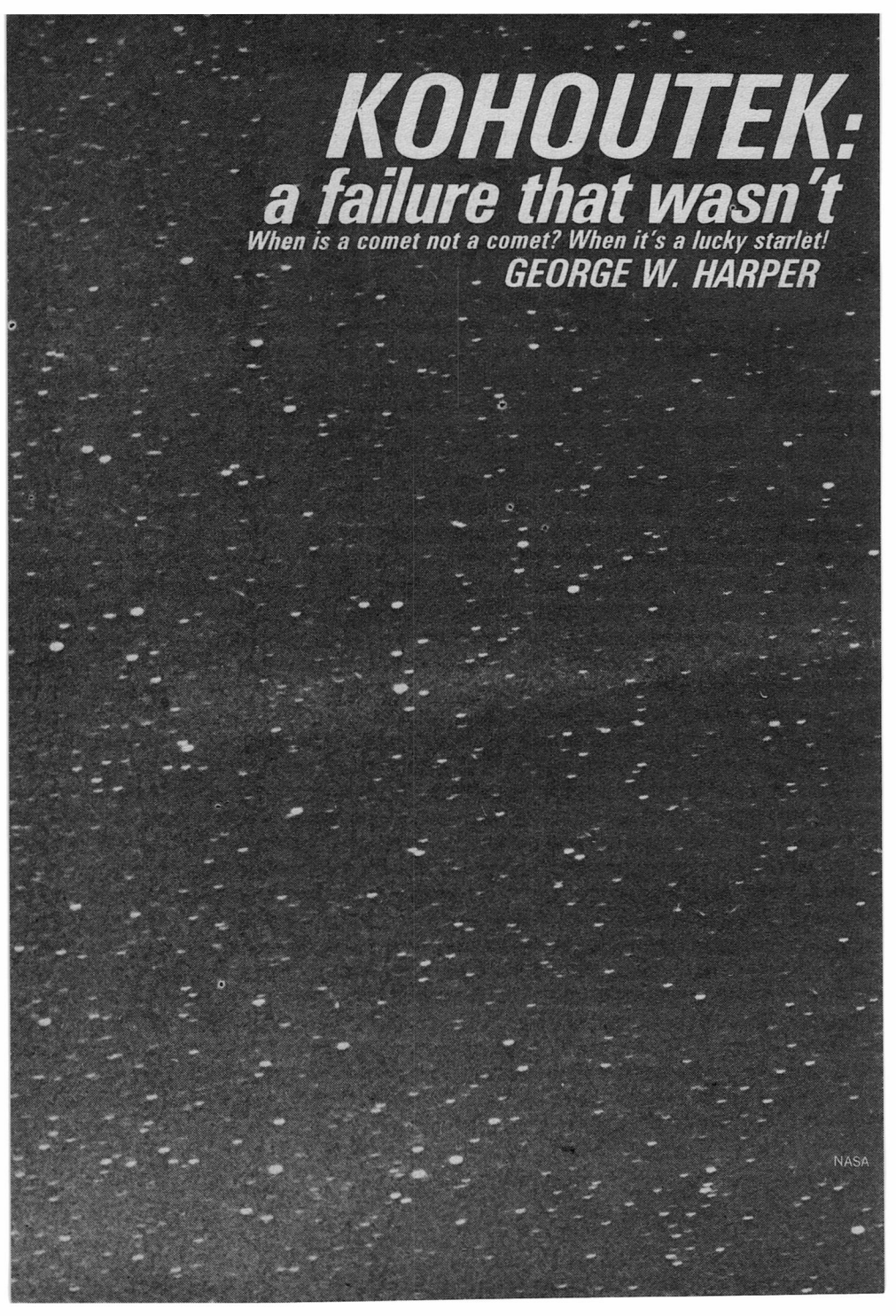
"Dr. Peterson's going to hate losing Jill and Susie . . ." He looked back at me for a second. "You'll tell Judy?"

"She'll know. Not at first. Later."

He winced. It was going to be tough on the family. His only other choice would be tougher. He waved, just a quick flash of a hand, and dropped through the bottom of the shelter.

A long time after, as I swam alone back to the mining station, I saw a whole school of sharks. One was wounded, and the others were tearing him to pieces, eating him while he was still alive.

I wondered if they'd see me, but I didn't really care. ■



KOHOUTEK: a failure that wasn't

When is a comet not a comet? When it's a lucky starlet!

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There are times when failure tells us more than success. We learn from the failure while too often success only makes us smug. The late Comet Kohoutek, which began by being billed the "comet of the century" then faded in the stretch to become the "Edsel of the firmament," may well prove to be one of the more successful failures—at least in the sense of teaching us something new about our Solar System. Its behavior provides a number of insights bearing directly on the model of the Solar System I proposed in the article "Styx and Stones; and Maybe Charon Too" (Analog, November, 1973). It also adds a new dimension to the picture and fills in certain elements which were not touched on in the "Styx and Stones" article. But at the same time, it reinforces the basic model advanced there.

For our purposes, the story may be said to begin with an item which appeared in the "News Notes" section of *Sky & Telescope* in May, 1973. It reported:

"The newly discovered Comet Kohoutek (1973f) should become a conspicuous naked-eye object, 1st magnitude or brighter, around the end of this year.

"It was found at Hamburg Observatory in West Germany by Lubos Kohoutek on the evening of March 7th, while he was making photographic observations of minor planets. On two plates it appeared as a 16th-magnitude diffuse spot, moving very slowly northwestward near the head of Hydra.

"At that time, Comet 1973f was still five astronomical units distant from the Sun. According to preliminary orbital elements calculated by Brian G. Marsden, Smithsonian Astrophysical Observatory, it will pass through perihelion on December 29, 1973, at about 0.14 astronomical units from the Sun. This great decrease in heliocentric distance promises a spectacular increase in brightness."

There were several elements in this which combined to give a presumption the comet would be noteworthy. First among these was the distance at which it was detected and its brightness at that point. Generally a comet at five a.u. (1 a.u. = 93,000,000 miles) will have a brightness a full magnitude or so less than observed in Kohoutek. In effect, the comet began its observed life some two to three times brighter than the usual comet when being seen at the same distance. And if it was brighter than normal out there, it would seem likely it would continue being brighter than the usual comet at *all* distances from the Sun.

The orbital track added to the promise. The comet was going to come close to the Sun; within 13,000,000 miles of the center. There are a number of comets which come closer to the Sun, but

this is still a good, solid, close approach. It would increase the apparent brightness of the comet in a direct way by providing more light for it to reflect, and in an indirect way by increasing the amount of gases the comet would generate and thereby add to the reflective surface.

The orbital track was even more favorable when considered in relation to Earth's track. On the comet's outbound course it would intercept Earth's orbit only 60,000,000 miles behind us. A poorly placed comet might wind up crossing Earth's orbit as much as 180,000,000 miles away and squarely on the other side of the Sun, where it would be invisible. Anything which passes within 60 million miles has to be considered relatively close and favorably placed for viewing. And being close, it would also appear brighter.

Then there was a sort of false promise deriving from the preliminary *e* (orbital eccentricity) adopted for the determination of its orbital elements. And it's here we get to the meat of the Kohoutek problem.

As of 1965, a total of 583 comets had plotted orbits. Of this number, only 99 were short-period comets with low eccentricities. The remainder were long-period objects with orbits not much different from parabolas. As a matter of fact, any time we have an object whose maximum orbital distance is 20 times the minimum, we have an eccentricity greater than 0.9. And any object coming inbound from the edge of the system toward the Sun is certain to have an eccentricity approaching 1.0. Halley's Comet, for example, has a period of 76 years and ranges from 0.59 to 35.31 a.u. This gives it an *e* of 0.967. If the *e* were 0.999 it would have a period of 32,000 years. As we are trying to measure such long-period orbits from observations being made over a segment less than 0.01 the full extent, it becomes nearly impossible to determine the *e* accurately.

This leads to the paradoxical situation where nearly half of *all* cometary orbits plotted, 284 out of 583, are known to be fictitious! There is no such thing as a parabolic orbit. There cannot be such an orbit. A parabola closes only at "infinity," and an "infinitely" long, closed orbit is merely a fiction used to define the transition point between a closed and an open curve. Yet we find half of all cometary orbits officially described as parabolic! Seventy others are hyperbolic, or open orbits indicative of objects which will depart the Solar System entirely. Only 130 long-period orbits are defined as being elliptical, and all of these range upward of $e = 0.995$.

So when we see a comet coming in from the fringes of the system we immediately conclude the eccentricity will not be significantly less than 1.000 and we compute on

that basis. Often we are never able to refine our values far enough to decide whether the object is elliptical or hyperbolic, and we therefore continue listing it as a "parabolic" orbit.

When Kohoutek first showed up it was obviously inbound from a pretty good distance out, so the first approximation assumed a parabolic orbit. By a tacit convention, astronomers translate a "parabolic" orbit to mean a comet inbound from the region of the comet halo. This halo is assumed to consist of perhaps 50 million comets in slow orbit around the Sun with mean distances ranging between 30,000 and 50,000 a.u. A comet in circular orbit at 30,000 a.u. will have a period of 5.26 million years while one orbiting at 50,000 a.u. would require more than 11.4 million years to complete a full orbit. But as high-eccentricity comets coming in from the halo will spend a good portion of their orbits inside these extreme ranges, their periods will necessarily be somewhat less. A typical comet inbound from the halo will have a period ranging between 1.5 and 3.5 million years.

When Kohoutek's provisional initial orbit was computed, it was assumed Kohoutek belonged with the family of parabolic comets. It would have a period of perhaps three million years. There would also be an excellent chance this would prove to be its first pass through the inner portions of the system. If so, it would be rich in frozen gases and ripe to make a spectacular display as tens of thousands of square meters of gas boiled away.

This, then, was the promise of Kohoutek. What went wrong?

The first hint of peculiarity began showing up as we found ourselves increasingly able to refine the elements of the comet's orbit. With each successive approximation the *e* decreased. Ultimately we found the orbital period to be on the order of 75,000 years—a considerable time but certainly far less than originally thought. This corresponds to a mean orbital distance of roughly 1,800 a.u.

It is also a rather odd distance. It is far too close to place Kohoutek among the halo comets. It is too distant to promise easy explanation in terms of perturbations by the inner planets during the course of an earlier passage. Nevertheless, if there were no other indications suggesting alternate explanations we would be reduced to using this as an excuse. But either way, the reduced *e* of the object provided the first hint of possible difficulty.

A different sort of problem began showing up early in October, 1973, when brightness measurements showed the infrared luminosity was comparable to reflected sunlight. This was quite disturbing because it implied the matter being shed by the comet was not being

excited by solar radiation in the way we would expect. It was mainly dust particles being thrown off and we were getting very little indication of large quantities of gases.

By mid-October we were obtaining bright, continuous spectra from the region of the comet's nucleus—again an indication of pure reflected sunlight with no significant quantities of gases being emitted by the nucleus.

Finally, by mid-November, spectra taken with the 120-inch Lick telescope showed a complete absence of usual cometary absorption features; a further indication of an abnormal gas deficiency.

By this time astronomers were frantically hedging their bets. Now it became a race to see who could be the most pessimistic. Only the scientific popularizers and frighthawkers were still talking about the "comet of the century." Astronomers on top of the situation were wishing they had never mentioned it to begin with. But of course, with the deluge of publicity in full cry, it was too late to turn the spigot and matters had to go their full course.

Matters looked up momentarily when Kohoutek "turned the corner" and passed perihelion. There were a few brief reports suggesting the comet had a "quite satisfactory" luminosity. But this short burst of optimism faded along with Kohoutek, and by the first week of January, 1974, one disgruntled astronomer was heard suggesting Kohoutek was a victim of a "solar glazing effect" which was somehow preventing the gases from escaping! Following that profound hypothesis, Kohoutek literally disappeared from view, in both senses of the word. Even the newspapers forgot it.

As we review the matter, the peculiarity of the comet becomes increasingly pronounced. In virtually every element we sense something subtly wrong. The mean distance is disturbing, but not overwhelmingly so. But why should the comet have been so visible at discovery and yet so disappointing at perihelion? And how do we reconcile the spectral data with observations of other comets? There is something in all this which simply does not jibe; some basic difference between it and normal comets.

To determine this difference we must take a closer look at the conventional, "normal" comet. Find out how it ticks, then we may have a better crack at seeing what happened with Kohoutek.

We have a choice between two alternative models of a comet. The first considers it a sort of "dirty" iceberg, generally around 15 to 30 miles in diameter, and with the "ice" component consisting mainly of frozen methane, ammonia, water, cyanogen, carbon monoxide, carbon dioxide, and a few odds and ends of trace frozen gases. Alternatively, there is the "sandbank"

model which pictures the nucleus not as a single object but as a cluster of dust and ice particles traveling together in a common orbit. There are a number of objections to the sandbank model and it is not generally accepted, but both models are sufficiently alike that it makes no difference so far as our present purpose is concerned. Both models depict a comet as consisting of a loose aggregate of frozen gases.

Mixed with these gases are fairly substantial quantities of solids in the form of dust and extremely fragile, almost lacy rocks. Typically, such solids will have crushing strengths not much greater than rime ice or loosely-packed snow. This is in contrast to the high-density material which comprises the asteroids. While there may be a few moderately high-density inclusions in a cometary nucleus, such fragments appear quite rare. Thus, the Tunguska Meteorite, which struck central Siberia on June 30, 1908, is noteworthy for the virtually total absence of meteoritic material. Even the so-called meteorite craters found in the area turned out to be unrelated to the event. The region is one of permafrost and the craters were found to be simple pengos caused by frost heaves. A concentrated effort to discover meteor fragments proved unavailing, an observation which has prompted a few of the more exuberant writers to call it "an alien spaceship which blew up," or even an "antimatter" asteroid.

Both these extremes were proved impossible by the results of the 1958 expedition sent out by the Soviet Academy of Sciences. Careful examination of the site disclosed silicate and magnetite dispersion matter and spherules of an intermediate type attributable to the Tunguska object. Since there *was* a deposit of meteoritic material even though no actual fragments were found, it is clear the object was neither spacecraft nor antimatter. From this and other supportive evidence astronomers are generally agreed the Tunguska object was not a conventional minor asteroid but a cometary nucleus which chanced to collide with Earth and exploded just before striking the surface.

Atmospheric phenomena following the Tunguska event tend to confirm the analysis. Reviewing reports of the time, the night following the fall was so bright that people in the Caucasus, over 2,500 miles away, were able to read newspapers at midnight. Abnormal night brightness continued until about the end of August. This is presumed to be caused by dissipated tail matter in the atmosphere catching and reflecting the Sun's light. And to show that science is a two-way street, in 1949 Soviet astronomer Fessenkov obtained a record of measurements of the transparency of the Earth's at-

mosphere made in California through most of 1908. In checking the records he discovered that from the middle of July through the second half of August there was a noticeable lessening of the coefficient of transparency in the atmosphere. This, he concluded, was caused by the release of several million tons of gaseous and particulate material entering the atmosphere at an ultra-high velocity which may have exceeded 50 miles per second. Flashing through the atmosphere, the Tunguska object caused enormous damage as the hypersonic bow wave raced across Siberia. But when it finally reached the end of its trajectory there wasn't enough solid matter even to make a dent in the ground!

Many different lines support this picture of a comet. We have a number of meteor showers which demonstrably follow cometary orbits. The Andromedids, for instance, move in the orbit of Biela's Comet. The Orionids and the Eta Aquarids move precisely along the track of Halley's Comet, and so forth. By triangulation from two or more sources we determine that when a meteor enters the Earth's atmosphere it begins to incandesce at an altitude of roughly 90 miles. By 45 miles it has burned out. From this we determine their average densities to range from 0.2 to 1.0. By contrast, the bolides, or meteorites which appear randomly and are seldom found coming from a comet radiant, will have densities falling between 5.0 and 8.0. These bolides, or meteorites, appear to be essentially asteroidal in nature and are presumed to be infalls from the asteroid belt. Whether their origin can always be explained in this way is perhaps questionable, but one thing is clear: the typical bolide has a different origin and structure than the typical meteor.

Another indication of the lack of structural strength in conventional comets is their habit of splitting apart under tidal stresses of the Sun. Biela's Comet, for instance, literally fell apart during a close passage, emerging from behind the Sun as a slowly separating pair of objects. When they returned, in 1852, they were a distinct doublet, separated by many degrees of arc. Scheduled to return in 1858, they were never seen again. But they left behind the legacy of the Andromedids, so we can infer the fate of the lost fragments.

Among others suffering unexpected accidents: 1957 VI (Comet Wirtanen), which broke into two sub-comets as it closed on the orbit of Jupiter; Comet 1882 II, which broke into several pieces during perihelion passage; and Comet 1965f (Ikeya-Seki), which developed a double nucleus and split into two comets about 12 days after passing perihelion. Other comets, such as 1929 III (Ensor), have simply disappeared when they approached too near the Sun.

But this may not be the whole picture. So far we have talked of "typical" comets, all of which appear to be characterized by small "real" size, fragility of structure and disproportionately large fractions of frozen gases. Astronomers generally start with the assumption this is the whole of the matter, but they also tend to depart from this model on a number of occasions. For example, there are a number of "peculiar" satellites wandering about in the Solar System. Jupiter, for instance, has a family of three satellites, numbers VI, VII and X, having radii of 65, 22 and 7 km respectively, and which move in virtually the same orbit. (See the table opposite.) There is a strong suspicion the three were originally a single object which was captured by Jupiter and which later broke up.

Further out, Jupiter's outer four satellites, numbers VIII, IX, XI and XII, all move in retrograde orbit around the planet. Their sizes are consistent with typical cometary nuclei, their orbits are quite similar, and there is reason to suspect they too were captured by Jupiter and possibly also were part of a single body which broke up during or after acquisition.

The easiest initial assumption is that all seven objects were simply asteroids picked up from the asteroid belt. Many texts suggest such an origin. But the same authors then turn around and hint they may be cometary nuclei, citing the probable breaking up of the objects, the retrograde orbits of the outer four and the relative unlikelihood that the less eccentric asteroids could be picked up in this way.

Adding to the problem is Saturn's Phoebe, moving in a highly inclined, eccentric, retrograde orbit looping far beyond the tracks of Saturn's regular satellites. With a radius of some 130 km, Phoebe is an unlikely candidate for comethood, but how else do we describe it or account for it? It is well beyond the asteroid belt. It certainly has to be a capture, but its orbit would imply a highly inclined asteroid well off the plane of the belt.

Nereid compounds the chaos. In the "Styx and Stones" article I pointed to the probability that Pluto is a lost satellite of Neptune. If we accept this, then Nereid must have been acquired after Pluto broke away. This would imply the acquisition of an object with a 270 km radius, a high inclination and even higher eccentricity at a distance far past any influence from the asteroid belt.

Nor does it help if we try to postulate the more remote objects as cometary nuclei which are outgassing enough to give a simulated larger size. The spectra of Phoebe and Nereid are undetectable. This means they cannot be small objects with gassy envelopes. They are essentially solid objects with appreciable diameters.

SATELLITE DATA (BY FAMILY)

	Object	Radius (Km)	Mean Orbit (Km)	Period (Days)	Inclination	Eccentricity
JUPITER	JV	85	181,000	0.498	0°.4	0.003
	JI (Io)	1,750	422,000	1.769	0°.03	0.01
	JII (Europa)	1,550	671,000	3.551	0°.55	0.01
	JIII (Ganymede)	2,500	1,070,000	7.155	0°.2	0.01
	JIV (Callisto)	2,450	1,883,000	16.689	0°.3	0.01
	JVI	65	11,470,000	250.0	28°	0.158
	JVII	22	11,740,000	260.0	26°	0.206
	JX	7	11,850,000	255.0	28°.5	0.135
	JVIII	6	23,500,000	737.0	33°R	0.40
	JIX	7	23,700,000	758.0	25°R	0.27
	JXII	6	21,200,000	631.0	33°R	0.16
	JXI	8	22,560,000	692.0	16°.5R	0.207
SATURN	SX (Janus)	185	160,000	0.75	0°	0.00
	SI (Mimas)	450	186,000	0.94	1°.5	0.020
	SII (Enceladus)	275	238,000	1.37	0°	0.004
	SIII (Tethys)	600	295,000	1.89	1°.1	0.0000
	SIV (Dione)	410	377,000	2.74	0°	0.002
	SV (Rhea)	650	527,000	4.52	0°.3	0.001
	SVI (Titan)	2,425	1,222,000	15.95	0°.3	0.029
	SVII (Hyperion)	175	1,481,000	21.28	0°.5	0.104
	SVIII (Iapetus)	575	3,560,000	79.33	15°	0.028
	SIX (Phoebe)	130	12,950,000	550.5	30°R	0.163
NEPTUNE	NI (Triton)	1,900	353,000	5.88	20°R	0.00
	NII (Nereid)	270	5,600,000	360.0	28°	0.76

Putting the pieces together we begin to arrive at the conclusion that Kohoutek was not really a comet at all!

In the "Styx and Stones" article I postulated the existence of an asteroid halo existing beyond Pluto in the space ranging between 100 a.u. and 30,000 a.u. This region could possibly possess several hundred thousand asteroids, minor planetoids, and several Earth-sized planets wandering about in random orbits between the inner planets and the comet halo. Kohoutek, with a mean orbital distance of 1,800 a.u., would be a typical example of a minor asteroid. As such it would be considerably larger than a normal comet. Rather than a radius of 15-30 km, we postulate a radius of from 50-75 km. Structurally it is assumed to be primarily a stony basalt of somewhat irregular dimensions, deeply fissured, with possible massive fracture lines extending throughout. Overlaying the surface to a possible depth of several meters was a blanket of frozen gases which may have been acquired long before our Sun coalesced into a star or the inner planets began accreting.

For uncounted eons it wandered about in the region around 1,800 a.u., occasionally drifting within a few tens of millions of kilometers of similar bodies, but for the most part moving in splendid isolation. To give some idea of the vastness of the region and the remoteness of the orbiting asteroids—if we assume 20 Jupiter masses, locked in the form of 500,000 lunar-sized objects orbiting between 100 and 30,000 a.u., we find each lunar object occupying 226 *million* cubic astronomical units! Or by putting it another way, we would have a single asteroid, one km in diameter, for every 200 million cubic km of space providing we assumed a uniform lunar density in the asteroids and further postulated the same size for each fragment.

But even with so great a volume of space to play around in, sooner or later there will be a close encounter between two or more objects. And whenever this occurs there will be a transfer, exchange or cancellation of kinetic energy. The trajectories of both objects will be altered and they will acquire new orbits. Assuming Kohoutek to be one of these asteroids, we can see that when the transfer of kinetic energy occurred one of two things must have happened; either it immediately lost momentum and started a long plunge inward toward the Sun, or it gained momentum and climbed outward, gradually slowing until it finally exhausted its excess of energy and commenced an ever-increasing acceleration toward the inner reaches of the system. Either way, it was fated to arrive.

Being an asteroid and considerably larger than a normal comet,

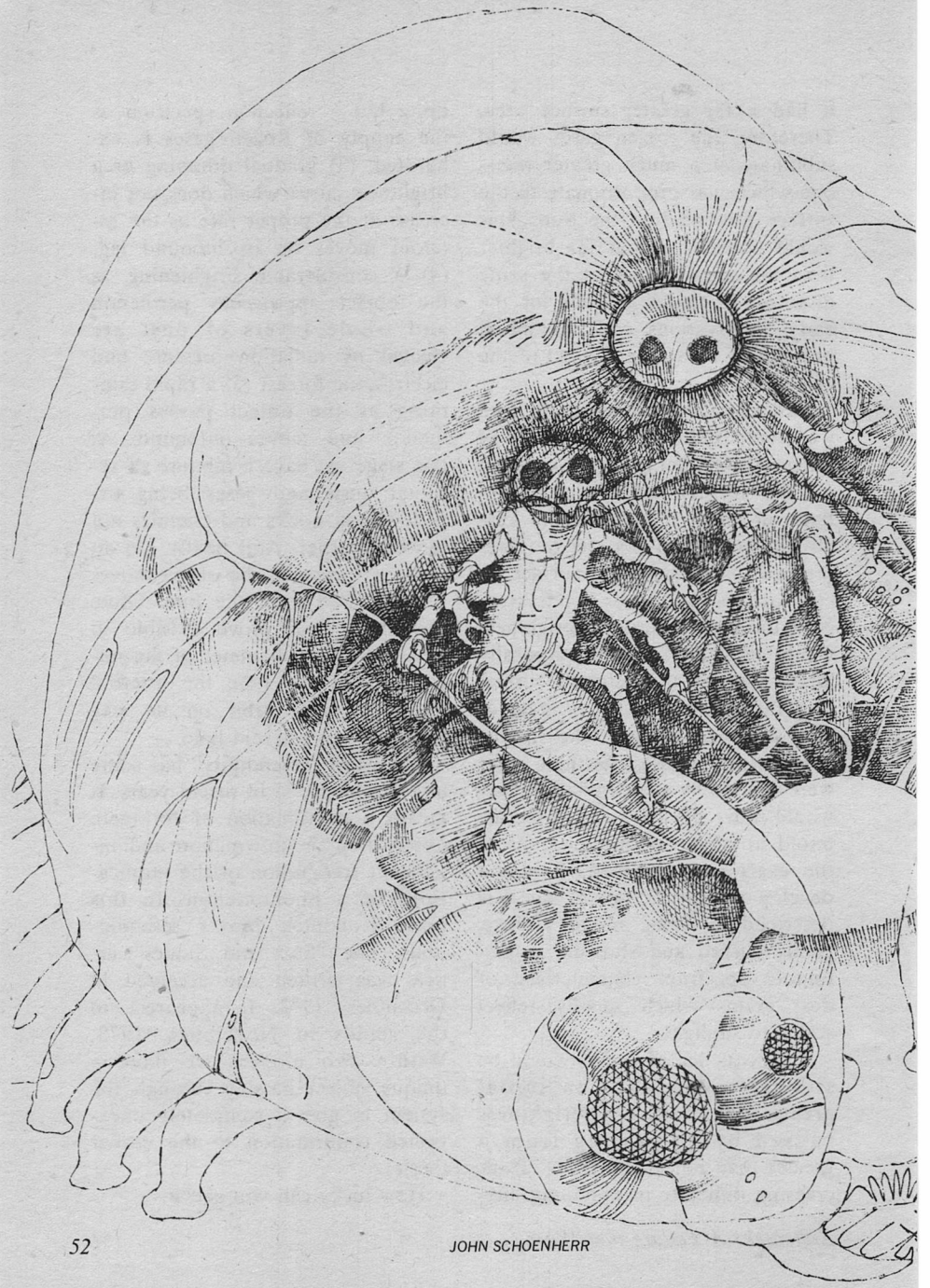
it had a far greater surface area. Therefore, the frozen gases would sublimate at a much greater rate—one which was proportionate to the surface presented to the Sun. This would make it appear far brighter than the usual comet at the same distance. It would account for the early observations and its initial promise of being the "comet of the century."

But when it approached the Sun we would discover an unexpected phenomenon. Being thinly overlaid on the surface, the gases would burn off rather rapidly. Before long all but occasional pockets of gases trapped in crevasses and surface irregularities would be exhausted. Now the main sources of brightness would be caused by the physically larger size of the asteroid proper plus the predictable heavy layer of dust which would coat the surface along with the gases. As these dusts were excited by solar radiation they would move off the body of the asteroid to create luminous clouds of the exact sort observed. It would develop a *Type II* tail of the sort described as being broad, diffuse, gently curved and showing a continuous spectrum characteristic of dust grains which merely reflect scattered sunlight.

The sequence of events would be straightforward: (1) an initial greater than average brightness caused by outgassing from a greater than normal surface; (2) increasing difficulty in obtaining anything but a reflection spectrum as the supply of frozen gases is exhausted; (3) gradual dimming or a brightness curve which does not increase at the proper rate as the asteroid moves on its inbound leg; (4) a considerable brightening as the object approaches perihelion and whole layers of dust are ejected by radiation pressure and electrostatic forces; (5) a rapid dimming as the object passes perihelion and moves outbound. At this stage we have a mixture of residual dusts and gases being expelled from nooks and crannies not touched earlier. And finally, (6) an early extinction as the object moves further away from the Sun. Quite possibly it will prove feasible to measure a true diameter of the nucleus about the time the asteroid passes Saturn's orbit on its way back into the asteroid halo.

The word "serendipity" has come into the language in recent years. It means a combination of fortunate observation or anticipation and intelligent recognition of the implications of a phenomenon. In this sense Kohoutek proves serendipitous. The "Styx and Stones" article was written and accepted in December, 1972. It appeared on the stands in November, 1973. Within two months we have a unique object passing through the system to give a completely unexpected confirmation to the earlier thesis.

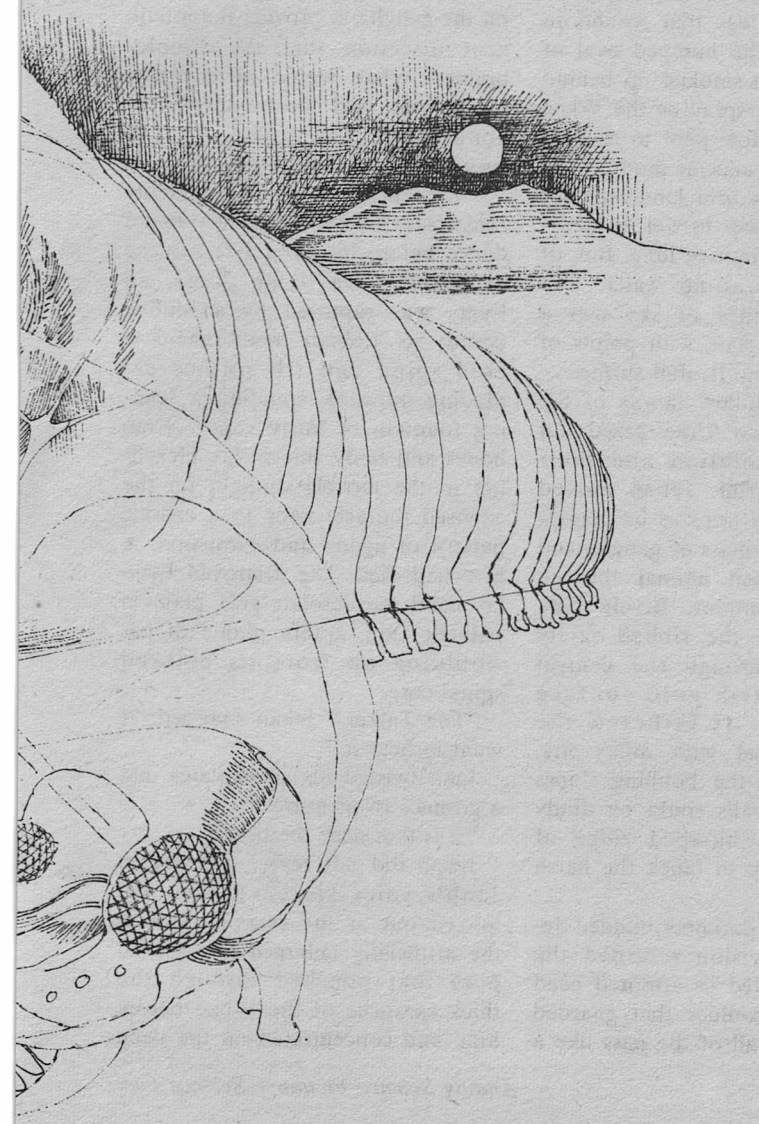
How lucky can you get? ■



JOHN SCHOENHERR

FORCED CHANGE

An organism must adapt to its environment if it is to survive.
But an intelligent organism . . . **BOB BUCKLEY**



The creature came slowly over the softly mounded floor of the canyon. The sun glistened brightly across its scarlet carapace, exploding in scintillating sparks from flashing pedipods and belt legs that wound in strips beneath the humped oval of body. Gray dust smoked up behind in a fast-falling spray as the Whae crept from shadow pool to shadow pool like some ancient monster exploring a fatally arid landscape for coolness and water to wet its laboring gills and primitive lung. But, of course, there was no water. The cloudless expanse of sky was a mocking black slate with points of chalk pecked into its dull surface.

Within the hollow thorax of the tank animal two T'rae gazed out upon the desolation and their minds were grim. Jehan moved only his spindly arms as he manipulated the pale mass of ganglia and guided the great animal through the canyon complex. Beside him, Janh clung to the ribbed cavity staring out through the central pore. A whitish gold sunface peered back. It lathered the scratched crystal with milky fire, through which the bobbing slopes of the steep walls could be dimly seen; then, a humped ridge of stone reared up to block the harsh sunlight.

The sudden darkness blinded Jehan. Before vision returned the Whae had butted its armored head into a great boulder that guarded the opposite wall of the pass like a hulking sentry. The tank animal growled threateningly as it attempted to shove the massive stone aside, and failed. Jehan leaned forward and touched a precise node on the ganglia to provide the intelligent direction that the simple-brained Whae would never know on its own, and the boulder tilted ponderously and rolled, its fall cushioned in a shallow bed of dust.

They lumbered on, and suddenly Jehan saw a vivid imaginary figure dance before his eyestalks: a scene of horror as a living dome, an Eyno, was ruptured by a hidden bomb; its ribbed; membrane-covered spine and rib splines exploding outward, spouting a leaping fountain of misty vapor. T'rae bones and body shields lay bleaching in the terrible sunlight on the exposed thoracic floor in a chaotic pattern of agony and extinction. A hive had died. The destroyed Eyno lay amid the desolate gray plain in pathetic ruin, a thin plume of gas wobbling up from its cracked spinal core.

"The Talker," Jehan snapped. "I want to hear it."

Janh twisted his cheekplates into a grimace of pleasure.

"It is that near the time?"

Jehan did not reply; the glee in Janh's voice sickened him. He looked out at the canyon through the artificially enlarged and glazed pore that punched through the thick carapace of the Whae before him, and concentrated on the deep

tracks that were still impressed on the dull colored dust and stones of the rill floor, as they would be millions of revs hence, for Waena changed only slowly, if at all.

Ahead, a wide fanlike slump of gravel and boulders nearly touched the opposite wall. It had proved a problem earlier when they had first entered the canyon.

As he guided the Whae about the slide, Jehan tried to drive the image of the ruined Eyno from his brain, but in his distraction he allowed the huge animal to approach too near the far wall and the right band of pedipods scraped on stone.

The animal groaned inwardly, the sound of its pain loud within the hollow, and slewed violently, straightening only as Jehan reexerted his control. The T'rae wheezed as a large globule of sweat splattered wetly down his hard thoracic plates, and suddenly the hollow seemed very cold.

Now the scarlet blob of tissue—plastered wetly across one of the exposed veins of the Whae—began to mutter as Janh brushed an articulated forehand across its spinal ganglia.

"Sector seven seven three, severe water leakage reported. Eyno tissue techs Jki and Jko assemble nerve corridor six for axon weld . . ."

Jehan tried to ignore the mutter of sound from the Talker even though he had asked for its activation, concentrating instead on the airless landscape.

"I wish . . . I wish there had been another way," the T'rae said softly.

Janh turned slowly, his eyestalks quivering, multiple lens flashing brightly in the sunglow now pouring in through the pore, as if the T'rae bore two sparks of green fire atop his narrow domed head.

"Our hive was destroyed! How can you feel any sympathy, any compassion for thieves and murderers?" Janh pointed at Jehan's thorax, emphasizing a dark, crusty stain that clung there. "His blood still spots your shield, our own nest brother, and he died killing the invaders of our sanctuary, the despoilers of our life system, Ghoulae who kill in fun and live off the blood of their victims."

The younger T'rae pushed the accusing finger away and turned his sight back to the canyon. For a time the only sound was the throbbing thunder of the Whae's blood through the ribbed walls of the hollow, and the harsh grind of stone beneath the pedipods.

"How does this bring Jkio back?" Jehan asked at last.

"It doesn't, but Jkio may rest easier knowing his murderers have been punished."

"And those in the Eyno who had no part in the deed?"

Janh laughed coldly. "If they live in the Eyno, they take part in the decisions of the Eyno. Such it has always been, and such it always shall be. Do not fear killing so,

brother; only through death shall we increase our own water, our own air, for Waena has not enough for all who suck her stone. Life is for the fit, and by this killing we prove our fitness."

So it is done, Jehan thought. With no way left to reverse the decisions born in rage. The T'rae knew a sickness in his gut, for suddenly he knew himself to be a coward.

The Whae struggled up a steep rise and escaped from the notch of the canyon. Before it lay a slash of shadow and an endless expanse of darkly bright desert. The Whae slowed uncertainly as it crept from the darkness and shelter of the canyon, because his kind did not enjoy light. Their past was of darkness that still lived in their primitive brains no matter how the T'rae had shaped their bodies.

Within the living womb of the hollow the Talker began to emit a soft popping sound, and Jehan found his thoughts on Jen, his chambermate. At least with the female there were no torn remains to shudder over, as there had been with Jkio. The raid had not only taken food, water, and air, but females as well. Jen's fate had been clean, leaving nothing behind but a bittersweet memory.

Hard snaps of sound burst from the membranes of the Talker. Mixed in with the noise was a mutter of T'rae voices.

"Adjust it!" Jehan snapped at Janh.

"The creature is old," Janh complained. "We should kill it so we can petition for a replacement."

"Can you think of nothing but death?"

A voice grew out of the noisy confusion, and Janh fought to stabilize it, massaging the Talker's flabby body with his fingers. At last the voice came through strongly.

"Core tap incomplete. Regrow tap nodules and insert growth hormones . . ."

Jehan squirmed on the smooth pad of flesh that made a perch beside the ganglia, and the Whae ground on in its mindless flight, approaching a wide, shallow rill that snaked across the plain and disappeared into the distance. On the horizon a low range of hills had appeared with a single blunt mountain rearing from its center. Just above the brownish peak the Third World hung like a drop of cool water, seemingly poised to fall, but nothing more than a tantalizing lie in reality.

The Talker made a noise: an unpleasant sound, sharp and deadly. The voice rose, then faded into moaning incoherence, while in the background a shrill screaming began, and the Whae rumbled on with silence draping its hollow like a mourning cloak.

Janh prodded the Talker into inactivity, its task finished for the moment. Now they had the choice

of returning to the dead ruin of their Eyno beyond the mountains, or making for a still-living colony. Perhaps its members would accept them as long as they brought a Whae with them; Whae were useful.

"There had to be another way!" Jehan punched savagely at the unprotesting ganglia and the Whae accelerated with a useless surge.

Janh said nothing.

As the tank animal nosed over the steep rim of the rill it flopped forward at an angle, and Janh was forced to grab for support. Amid the confusion the rill lip suddenly exploded into incandescence. Dust rocketed skyward, and moments later the entire rill seemed to flash white.

"Night stones!" Jehan shouted at Janh.

Panic seized both T'rae, and Janh ripped their Breii from pouches hanging from the flesh walls of the hollow. He tossed one to Jehan. "Quickly," he shouted. "If we are struck . . ."

The statement did not have to be finished.

Jehan allowed the Whae to continue under its own control while he stood, and put his slim feet one by one into the wide, anterior invagination just below the limp head sack of the Breii. The organism's flesh was warm, slightly damp, a cloying, sweetish darkness that Jehan pulled up about him, fighting to seat the flopping head with its crystal-faced pores, and slide his limbs into each of the Breii's hollow appendages. Precious moments passed before Jehan pulled the two flanges of the slit together and squeezed their closure node. The Breii sealed itself and pressed close, enclosing the T'rae in a formfitting sack of protecting, living flesh. The air it exuded smelled musty, but it was air, and Jehan sucked it in through his abdominal pores hungrily.

Night stones were striking everywhere outside by now, and Jehan tried to speed the Whae, but found his fingers clumsy through the thick epiderm of the Breii that surrounded them like a glove.

"Hurry," he screamed at Janh, who was still struggling with his Breii.

Suddenly the Whae shuddered, and the hollow shook with the great animal's agony. Three times it cried as white fire jumped down through the roof in glowing lances. Bone splintered, and flesh steamed as fluids boiled away in the sudden, explosive decompression. Jehan felt his Breii tighten and swell about him, but Janh was not as lucky. A fourth filament of fire burst down and struck the T'rae. Red mist sprayed from the gaping slit of the sack animal, and like a discarded puppet of flesh, Janh fell slowly backward onto the steaming floor and lay still. The Breii writhed with its death throes, but there was not enough left of Janh to even twitch.

Jehan turned away, his eyestalks fighting to turn inward. He overrode the emotion and kept his attention on the Whae, squeezing certain nodes so that the animal ground forward to top the far rim of the rill and began a sluggish advance across the barren plain, but its track wavered, and Jehan knew the animal was dying, for it had been wounded grievously and its brain was exposed to vacuum. It slowed.

Now Jehan used his greatest skill, his most persuasive delicacy to urge the last shred of life from the beast. Two e'ls distant a range of low hills backed up to a mountain plateau. The hills were old: lava flows had dripped across their gently shelving sides, and rockquakes had cracked them. Bisecting one hill was a narrow cleft. It offered limited safety and Jehan steered the Whae for it.

The Whae was strong, it had to be to take a living from the cold breast of Waena, but even its great strength had limits and at last the belts of pedipods slowed and stopped. The walls of bone and tissue quivered and were still. Perhaps the Whae made some death cry, but Jehan could not know because the hollow Talker had been killed by the loss of air.

The night stones still fell, though raggedly now. So far a certain luck had held, but as Jehan wriggled up through the exit sphincter another stone struck the hillock of flesh that was the Whae. It quivered reflexively and Jehan was thrown into the hard pavement of lava. He rolled away from the corpse as other night stones crashed down about him. Dusty geysers walked slowly across the plain.

Jehan got to his feet and ran for the cleft, his fear close behind, shouting and screaming in his brain, and urging him on.

The T'rae dashed into the ebon shadow of the cleft just as a night stone exploded above him. Dirt and gravel showered down, coating his Breii with a gritty film of magnetized dust. Jehan pawed angrily at the crystal pores in the headpiece, but all he did was smear the coating around. Nearly blinded, he stumbled deeper into the darkness of the cleft.

The crevice was ancient, but it had retained its steep walls. The floor was littered with accumulations of shattered stone and soft dust and walking was difficult. Jehan careened from one wall to the other in confused helplessness. A faint scattering of sunlight filtered down from the upper crags, but at the bottom of the cleft the light was pale and misleading.

Jehan walked. Why he walked he could not explain, for there were no Eyno in the mountains. Only the Old Ones had chosen the crags and depths of the nameless hills for hive sites, and there were no more Old Ones. Waena had

killed them all. But still, Jehan walked.

Time passed as if in a dream, but finally the T'rae was forced by exhaustion to stop and rest. The Breii was heavy against his shields, and though it kept him alive through its metabolism, it was a burden, and visibility through its pores was marginal.

As Jehan sat quietly on a flat stone a shadow moved just beyond the turning of the cleft. Something small scurried out of the gloom, and the T'rae was astounded to see that it was an Oppet. The small scavenger of flesh had no possible reason for existing out here on the airless surface; an Oppet was a creature of the dark interior of an Eyno, a haunter of the dome's skin flanges where there was air, water, and dead meat.

The little oddity showed no caution in its approach, and because it was only a witless thing, Jehan crushed it with a stone and went to examine it more closely.

It was obvious from the first glance that the scavenger had been subjected to tissue sculpting, and reconstructed. Its mandibles were alloy-hard, and looked as though they could crush stone. The puzzle was, who would put such labor and time into a useless scavenger?

Jehan threw the crushed Oppet away and walked further into the depths of the cleft while strange thoughts wandered through his brain. The crevice narrowed somewhat as it wound back into the fractured hill, and about the distracted T'rae shadows darker than the shade shifted as movements stirred just beyond vision.

Suddenly Jehan froze. At his feet, partially obscured under a drift of dust, a slab of shaped stone had been incised with the sacred hieroglyphics of T'rophet. Was this cleft one of the lost dwelling places of the Old Ones? The thought was strangely exciting to the young T'rae, and he ran forward, eager and fearful at the same time.

The priests of T'rophet were remembered in legend to have had great powers and art. Some had actually known both Terza and Waena, and had walked the surfaces of each. But to actually discover one of the ancient places . . .

Jehan stumbled around a shoulder of stone and stopped, amazed. Ahead of him the cleft widened into a high walled valley. A shaft of sunlight bore down from the heights and illuminated a wall of dark stone into which a massive portal had been carved. Its lintel bore the hieroglyphics of the Old Ones and a huge metal valve sealed the portal, the sunburst of Gpom on its center and gleaming brightly in the sun.

Jehan walked slowly into the valley. So great was his wonder that he did not notice the many footprints that scored the dust.

The portal towered high, seven times the height of a T'rae, and the

door was untarnished. Jehan approached this, and reverently reached up to trace the rays of the sunburst with the mittpaws of the Breii. A sense of antiquity came to Jehan, for here was the work of the first immigrants to Waena. Here had lived T'rae who had actually seen and set foot upon the home world. The immediacy of his death was forgotten as Jehan looked upon the ruins.

Opposite the portal the cliff had been extensively carved so that anyone leaving the portal could not help but see the frieze. The carving was surrounded by an abstract design. Within the frame of the design a number of squares showed T'rae tissue sculptors laboring, each shaping one further component of the great ship, the vessel that had brought the T'rae from Terza. Below this, a great inlaid mosaic showed both hemispheres of Terza itself. Beautiful Terza, so lovely in life, and so dead now. Terza, the world of tombs and poisoned air. If only the great leap outward had not failed. But it was failing. Waena was too harsh, too niggardly with the necessities of organic life for the continued survival of the voyagers, and the Third World was too large, too lush for the T'rae.

Jehan felt his eyestalks clench, and forced them outward in anger. The T'rae would die, all things must die, but their greatest achievement would live on, for it was told here on imperishable stone for all who wished to see.

The T'rae turned to face the valve once again, pushed at it and was surprised to see it swing slowly backward into the rock, exposing a tremendous, darkened passage leading back into the heart of the hill. Sunlight reflected off the polished floor and illumined the sculptured walls, which loomed in silence, guarded only by the memory of the Old Ones, and years of desertion.

It was not without a twinge of fright that Jehan entered, but the urge to explore was strong, and he doubted the ghosts of the Old Ones would prevent his innocent curiosity, for had they not been afflicted by the same disease?

The light faded as Jehan walked slowly away from the open valve, but no wispy presences glided out from the shadows to block his entry. Indeed, except for the lightlessness, his venture seemed unopposed.

Behind the façade of the portal a hall began, huge and domed, with walls intricately carved with scenes of the home world, bits of the past and Jehan felt a constriction of his abdomen as he studied the leaping mountains and sprawling canyons that he had never seen, but knew to be beautiful in a part of his mind that was never conscious. The stone ceiling was lost in shadows, but still the T'rae could make out supporting arches carved in the

likeness of Albus, the tree; the tree that bloomed no more.

The hall extended straight back into the core of the hill, into heart stone, and the T'rae realized that he could not go further without a light, but fortunately the hall was not the only cavity. Several side passages split off from it, the ones nearest the cleft valley possessing tall, narrow windows faced with crystal. These, with the now open valve, allowed some light to enter the deserted temple. Once the hall and portal had been sealed, as the massive lock on the back of the valve testified. Entry through the portal was made only in ceremony, after the winds of life had been guided into holding, and preserved for later release. Elsewhere in the temple there were probably double-valved chambers of smaller size for everyday traffic.

Jehan wandered into the network of lighted passages. Vacuum had preserved the fixtures of the temple flawlessly. There were metal decorative ornaments fastened to the stone walls that could have only been fashioned on the home world, their predominant theme being the sunburst Gpom, the father of all life.

At intervals the passages divided and a narrow crossway would lead back into the darkness of the hill's interior. There, as in the hall, darkness ruled and Jehan could not go; but the passages were enough for the T'rae. There he found couches and stands of precious metal, and crystal tables set with empty dishes of metal and carved stone.

But, of course, no food; not in a place inhabited by the dead and their memories, for neither needed sustenance, and at last Jehan lay down on one of the many pieces of furniture and prepared to rest. The day had been filled with death. Perhaps when he woke the horror would be stilled, but for now it churned in his brain like a grisly parasite.

While he slept he dreamed that the Old Ones had returned, that they whispered about the foot of his couch and wondered at the T'rae and at what they had become. Almost they despaired, and Jehan tossed uncomfortably in his dream to think that the Old Ones might be displeased.

Then Jehan woke . . . and discovered that his dream had not been a complete fantasy. He was no longer in the passage, sunglow from the cleft windows no longer shone on him . . . and he no longer wore the Breii!

Jehan sprang from the metal bench, then froze as he saw the tall, hooded shape studying him from the deep shadows of the stone cell. The air was foul in the chamber; it seemed unused and forgotten.

"I know you, Old One," Jehan whispered.

"I know you, Jehan of Mour,"

the cowled figure said in a dry sibilance.

"You do?" Jehan trembled with confusion. The polite greeting was not meant to carry truth.

The Old One motioned with a robed arm and Jehan caught sight of a dry, withered member like the branch of a dead tree, nothing like the smooth exoskeleton of a living T'rae. Was this creature dead? A memory that had not faded with time?

"You will attend me, Jehan of Mour." The voice that issued from the cowl of the robe was quiet, but left no room for refusal. Jehan followed mutely as the Old One passed through a low portal of polished stone and entered a red-lit hall that sloped sharply downward into the very basement of the ancient hills. There was no opportunity to inquire of their destination, and the hall itself was barren of carving and ideograms.

"There is no reason to fear, Jehan of Mour," said the old voice, as if reading the T'rae's mind. The Old One turned his cowl and Jehan saw two sparks of green peering at him from the shadowed cave of dark cloth.

"I fear not, Ancient Master," Jehan said respectfully. "Your wisdom is said to be gentle."

"Indeed?" The robed figure halted by a small doorway though the passage extended further on into the rock. He pushed a stone door inward, and a cold draft moaned out. Jehan shivered. "Long have we suspected that our 'wisdom' has been as forgotten as ourselves and our teachings."

"Only by some, Old One. Only by the foolish," Jehan protested.

"And yet, today, many play the fool." The cowled head seemed to nod. "Even you, Jehan. You have slain more T'rae in one day than your loins will ever return to this poor shard of stone."

The young T'rae hung his head and found he could make no reply other than to follow the Old One into the chill chamber; it was as if another will moved his spindly limbs. Then the Old One summoned a light.

Jehan saw that they were in a sizable grotto of natural stone. Overhead, long tubes of bioluminescence glimmered, driving back the shadows, and on the polished floor crystal vats bubbled as their fluid contents were aerated. Behind the ranks of vats the metal casings of vast machines loomed.

"How will you repay your debt to your kind, Jehan of Mour?" The Old One studied the unhappy T'rae from the sanctity of his cowl. "Would you surrender your life that others might continue?"

Jehan felt fear mount his spine with fingers of ice, while beneath the hardness of his shields, his flesh crawled. But the fear was not in his mind.

"I am not a killer, Ancient One.

I took nothing but revenge for my hive brother, and my hive which was destroyed."

"Did your act bring life again to your Eyno, Jehan of Mour?" The Old One had not moved, and though his body and features were unreadable, his voice was sad.

"I did not enjoy it, Old One. But duty required it. The T'rae must have their pride." It was truth, but suddenly it seemed a shabby truth, even to Jehan.

"That we know, for you were not a violent being, ever. But all acts bear their responsibilities, and some demand restitution. By the old laws your life would have been forfeit, and here in these stone lands we still live by those laws."

Jehan's spirits fell. He did not desire death, but he knew the old laws had not been created lightly.

"Do you know what this place is, Jehan of Mour?" the Old One asked suddenly.

"I have never seen its like," Jehan admitted. "And please, do not address me as Jehan of Mour. Mour is dead. It died on the gray lands with my people."

"Then you have no one?"

"I am without a hive, and this day my last brother was slain by a night stone." In the nearest crystal vat Jehan noticed a floating body that looked very much like an Oppet. "You know this, of course."

"Of course. We know much, even now," the Old One replied lightly. A dry laugh came from beneath the cowl. "For the dead we are quite active."

These words did not cheer Jehan. Was this creature a walking corpse? He was beginning to believe it.

The robed figure moved to the nearest vat and bent to study the shadowy shape floating within. "Come, Jehan. Look on this."

The young T'rae did look, although the aroma rising from the bubbling liquid was hardly pleasant. Under the churning surface an unmoving animal form bobbed, anchored by tubes of flexible plasmeld. Within the tubes amber solutions moved slowly, some entering the body, some leaving. Jehan was not sure of the identity of the animal, but its form was like a pupa of the T'rae, though much too large, and greatly changed.

"Do you know what this is?" the Old One asked.

"No. I think I fear it."

"You fear life?" The old One's voice was sharp.

"Only bent life," Jehan answered after a moment.

"Ah," the robed figure sighed, and moved from the vat, seemingly satisfied, to the wall where he took a cup from a metal shelf and filled it from a crystal jug. The liquid poured out purple, and had an unwholesome, poisonous appearance to it. The Old One turned again to face the young T'rae.

"Do you accept my judgment, Jehan?" The old voice rang eerily through the emptiness of the cham-

ber, and Jehan trembled. But his voice remained strong, without a shiver of fear to mar it.

"I am a T'rae," he said proudly. "I respect and live by the ancient laws."

The cowled head nodded. "Then you must die by them, too, Jehan of dead Mour, for your life is forfeit."

The Old One held out the cup. As one in a trance, Jehan stepped forward and took it. He hesitated only a moment, remembering his life in the hive and the faces of his dead friends, most particularly Jen. Then he drank deep and long, and did not hear the cup fall from his limp fingers to ring loudly on the stone of the floor.

Light formed a drifting blob before blurred eyes. It was bright, almost painfully bright, but slowly the image sharpened, became so clear that its identity was certain. It was the sun. It shone with cold clarity over the rim of a cliff, the brown stone glowing harshly in contrast with the soft, ebon blackness of the sky.

"Jehan?" The voice was familiar, but it spoke only in the mind.

"Jen?" The words were but thought, the mouth would not, could not utter them . . . and Jen was gone. Death! Jehan was dead! The Old One had given him death.

"I'm here." Jehan felt a touch on his body and reached out. His hand found roughness, and he looked down from the heights for the first time. A female T'rae sat next to him on the dust of the cleft floor. Yet, it was not a T'rae. The shields were rough, not smooth, though the color was correctly scarlet, and the head seemed more massive, as well as the mandibles. They looked capable of crushing stone, and the abdomen had swollen from a tube to a massive oval. No longer was it a flexible bellows of tissue with the pore dots of breathing spiracles punctuating the soft flesh.

"The Old One promised to be along soon. He greets each new member faithfully, but you woke early, a sign of strength."

The mind voice was unmistakable. "You are Jen, but Jen is . . ." Jehan stopped in puzzlement.

"The slavers left me in the cleft as a sacrifice. It is their custom . . . or was, before you and Janh destroyed them. The Ancient Ones took me in and offered me life."

"But you're so changed."

Jen laughed. "And you are not?"

Jehan looked down at himself and would have sucked in his breath, but he found that he had no breath, nor could he speak with his mandibles in the creaking chatter of the T'rae. Instead, his mind seemed to transmit like a Talker, one to another.

"I am truly dead," Jehan wailed unhappily, "and have gone to a place of punishment."

A dry laugh interrupted the young T'rae.

"You live, Jehan of Gpom, and have met your hivemate already, I see." It was the Old One, still dressed in his shrouding robe, but as Jehan watched, the ancient T'rae loosened a belt, and allowed the robe and cowl to fall free of his body so that he stood revealed as another of the changelings, though his shields were a deep orange in color, evidence of great age.

"But you talked to me before," Jehan protested.

The Old One set his cheekplates in a smile and touched a small box that he wore on a belt fastened about his upper thorax.

"Have you not noticed where you are, Jehan?"

Then it dawned upon the T'rae like the bursting of a star. He was exposed upon the surface of Waena . . . and he lived.

The Old One took a bit of whitish stone from a pocket of the discarded robe.

"Should you begin to feel faint you must take some of this. You cannot breathe as you are accustomed to, and must 'eat' your air. It is a conscious act, plus you have to carry a supply of 'air stone' with you, so until you are used to keeping this discipline in the fore of your mind one of us will always stay by you. I suspect you would prefer the company of Jen, though, over my own aged self."

"What of water and food?"

The Old One removed more rocks from his robe.

"These can be broken down into the basic needs of T'rae metabolism. This dark stone contains water locked within its chemical structure, learn it well. These lighter stones supply food value; your abdomen now contains a small biological factory which enables you to take raw minerals, somewhat like plants, and transform them directly into the proteins and carbohydrates that your living requires. The roughness of your exterior absorbs sunlight and uses this energy in your metabolic processes. Now you must spend much time outside storing up energy to tide you over the long night of Waena." The Old One laughed. "I see you look baffled, but you will learn. Jen will help you. If our children can learn this new way of life, you certainly can."

"There are children here?"

"Of course there are children." Jen made her thought carry a chastisement for ignorance and lack of imagination. "We are still T'rae, and I am a female, just as you are a male."

Jehan considered that carefully and was delighted by its implications. The Old One nodded thoughtfully, seeing that his new student was catching on swiftly.

"But I was to die?" Jehan questioned suddenly.

"You are disappointed at discovering otherwise?"

"Of course not, but . . ."

The Old One laughed.

"Sometimes we must die before we can live. Come, Jehan. Once again, I would show you something." The Old One drew on his robe and strode off toward the portal of the temple. The great metal valve stood open, gleaming brightly in the sun, as small groups of T'rae passed in and out.

Jehan looked at Jen.

"Go on, I will prepare our chamber," she told him.

Jehan climbed awkwardly to his feet and tried to walk. His exoskeleton seemed heavier than his muscles remembered, and he felt sluggish. His joints creaked like old wood.

Jehan caught up to the Old One as he entered the portal. They turned to the right and continued up a lighted passage.

"How was this done to me?" Jehan asked finally.

"You were placed in a growth vat and reshaped in the same manner the tissue sculptors of Terza created the Whae and Eyno from more primitive creatures, an ancient technique and one never before used on the T'rae in the past; philosophical reasons forbade it, but fortunately philosophies change."

"But *am* I a T'rae?" Jehan pressed. "This is certainly not the body of a T'rae!"

The Old One motioned Jehan into a crossway and they began to mount a flight of broad steps. "A T'rae is a mind," the Old One replied, as if he felt the distinction obvious and above mentioning.

They climbed in silence for a time.

"The Eyno are filled with fools," the Old One told Jehan suddenly. "They have fought the harshness of Waena so long that the violence has been carried over to our own people, and become a force of destruction that Waena could never have achieved. In another twenty revs there will be no more Eyno on the gray plains, and for the Terza T'rae, Waena will again be dead."

"Then we are the Waena T'rae!"

"You grasp truth quickly, Jehan of Gpom."

The stairway narrowed and began to wind, spiral-fashion, steeply upward, as if they were in a natural chimney in the stone which the ancients had shaped to their own advantage. Though the walls were but bare rock, and undecorated with light globes, a pale, milky glow seeped down to them from the upper levels, and as they climbed the light grew brighter.

Abruptly the stair debouched into a short corridor ending in a small room whose front wall held a single large pore, which looked out across the rugged top of a flat plateau.

The Old One took a peculiar instrument from a stone ledge and handed it to Jehan. The T'rae took it carefully, for plainly it was a

thing of great antiquity, something of the home world and the days of the first immigrants.

"Look out across the plateau, you have but to hold the lenses before your eyestalks."

Jehan did as directed, childishly pleased at the manner in which distant features leaped wildly into nearness. He first scanned the horizon, then let his gaze wander the plateau.

"Old One!" The mental exclamation was involuntary. At first Jehan thought he was seeing the great ship, the very one that had carried the T'rae from Terza, but at once rejected this, for the objects resting on the plateau were machined from metal, and far too small.

The largest of the objects was a square platform with four long legs, and a tattered, incomplete appearance. A short ledge and ladder extended down from the flat top, and on the ground beneath the ladder was a heap of litter. A little beyond this a heraldic device mounted on a thin spike had been thrust into the ground, its bright colors contrasting strangely with the drab desert of stone.

A third of an e'l away, on the crest of a low hill, a four-wheeled car sat unattended; it had a number of angular projections pointing at the sky, and a boxy tube aimed down at the legged platform.

"Surely our people made nothing as unnatural as that?" Jehan asked at last.

The Old One laughed.

THE ANALYTICAL LABORATORY

The AnLab is your chance to tell us which stories you like best, and thereby reward your favorite authors with solid cash. It works this way: send us a card or letter with a list of the stories in each month's issue, ranked in the order in which you preferred them. We average the votes and publish the results here. The story that comes closest to having an average of 1.00 (which would mean it received a first-place vote from everyone voting) earns its author an extra one cent a word: $100, in the case of a 10,000-word novelette. The story in second place receives a half-cent extra per word.

PLACE	TITLE	AUTHOR	POINTS
1.	Hot Spot	*Brenda Pearce*	2.03
2.	The Time-Traveler	*Spider Robinson*	2.71
3.	A Kind of Murder	*Larry Niven*	3.03
4.	Earth, Air, Fire and Water (Conc.)	*Nemeth and Walling*	3.07
5.	Scholarly Correspondence	*Charles Eric Maine*	4.07

"No, that is not their work. But it is the reason we changed our philosophy about the physical manipulation of the T'rae. These objects appeared in the Rev of Ephe, the legged platform descending on a needle of flame, carrying within its body people of the Third World. They spent part of a day rushing about gathering stones, setting up devices, and driving wildly over the plateau on a car they had brought with them, but we had barely begun to watch them before they crawled back into the upper portion of their ship, tossed out what seemed to be their skins, and departed in a flash of fire."

The Old One lifted an arm and pointed at the black sky, and the lush blue globe hanging tranquilly above the plain.

"Obviously this station was but a feeble first step, but like all first steps it leads to others."

"And so began the changing of the T'rae," Jehan said.

"Yes, we deemed it necessary. The Third World is so bountiful in its resources that its peoples must never have known the strife of need. Thus, it was felt we could not meet them with the blood of our own people on our hands."

"What did they look like?"

The Old One shuddered slightly.

"Huge, at least three times our height, with great round heads, and wide clumsy bodies, though how much of this was protection against the savage charms of Waena we could not determine. And they were constantly hopping, jumping, running. They never seemed to hold still in their frenzied activities. Some thought them mad."

"But if the men of the Third World come to Waena to live, will they not have to change as we have done?" Jehan put the lenses to his eyestalks again and studied the relics.

The Old One did not answer at once. Instead he reached into his robe and withdrew two lumps of stone. He handed one to Jehan, and while they crushed the soft stone in their mandibles, they looked out at the odd metal devices of the men.

"I don't believe so," the Old One said finally. "Change was forced upon us because we tended to war among ourselves, but the men of the Third World must certainly lack this fault, being steeped in such plenty as their world provides. No, I think instead that it will be the T'rae who will change even further as the men come to teach us their ways, a meeting that may prove to be the climax of all the T'rae."

Jehan considered that. The Old One possessed the wisdom of countless ages of T'rae, and held the remarkable power of T'rae science. He erred only rarely . . . why, then, did Jehan feel once again the cold fingers of fear playing the tunes of terror on his spine? ■

THE ENGINE AT HEARTSPRING'S CENTER

Take away the will to live, and a man becomes a machine—no matter what his external appearance may be.

ROGER ZELAZNY

LEO SUMMERS

Let me tell you of the creature called the Bork. It was born in the heart of a dying sun. It was cast forth upon this day from the river of past/future as a piece of time pollution. It was fashioned of mud and aluminum, plastic and some evolutionary distillate of seawater. It had spun dangling from the umbilical of circumstance till, severed by its will, it had fallen a lifetime or so later, coming to rest on the shoals of a world where things go to die. It was a piece of a man in a place by the sea near a resort grown less fashionable since it had become a euthanasia colony.

Choose any of the above and you may be right.

Upon this day, he walked beside the water, poking with his forked, metallic stick at the things the last night's storm had left: some shiny bit of detritus useful to the weird sisters in their crafts shop, worth a meal there or a dollop of polishing rouge for his smoother half; purple seaweed for a salty chowder he had come to favor; a buckle, a button, a shell; a white chip from the casino.

The surf foamed and the wind was high. The heavens were a blue-gray wall, unjointed, lacking the graffiti of birds or commerce. He left a jagged track and one footprint, humming and clicking as he passed over the pale sands. It was near to the point where the fork-tailed icebirds paused for several days—a week at most—in their migrations. Gone now, portions of the beach were still dotted with their rust-colored droppings. There he saw the girl again, for the third time in as many days. She had tried before to speak with him, to detain him. He had ignored her for a number of reasons. This time, however, she was not alone.

She was regaining her feet, the signs in the sand indicating flight and collapse. She had on the same red dress, torn and stained now. Her black hair—short, with heavy bangs—lay in the only small disarrays of which it was capable. Perhaps thirty feet away was a young man from the Center, advancing toward her. Behind him drifted one of the seldom seen dispatch-machines—about half the size of a man and floating that same distance above the ground, it was shaped like a tenpin, and silver, its bulbous head-end faceted and illuminated, its three ballerina skirts tinfoil-thin and gleaming, rising and falling in rhythms independent of the wind.

Hearing him, or glimpsing him peripherally, she turned away from her pursuers, said, "Help me" and then she said a name.

He paused for a long while, although the interval was undetectable to her. Then he moved to her side and stopped again.

The man and the hovering machine halted also.

"What is the matter?" he asked,

his voice smooth, deep, faintly musical.

"They want to take me," she said.

"Well?"

"I do not wish to go."

"Oh. You are not ready?"

"No, I am not ready."

"Then it is but a simple matter. A misunderstanding."

He turned toward the two.

"There has been a misunderstanding," he said. "She is not ready."

"This is not your affair, Bork," the man replied. "The Center has made its determination."

"Then it will have to reexamine it. She says that she is not ready."

"Go about your business, Bork."

The man advanced. The machine followed.

The Bork raised his hands, one of flesh, the others of other things.

"No," he said.

"Get out of the way," the man said. "You are interfering."

Slowly, the Bork moved toward them. The lights in the machine began to blink. Its skirts fell. With a sizzling sound it dropped to the sand and lay unmoving. The man halted, drew back a pace.

"I will have to report this—"

"Go away," said the Bork.

The man nodded, stooped, raised the machine. He turned and carried it off with him, heading up the beach, not looking back. The Bork lowered his arms.

"There," he said to the girl. "You have more time."

He moved away then, investigating shell-shucks and driftwood.

She followed him.

"They will be back," she said.

"Of course."

"What will I do then?"

"Perhaps by then you will be ready."

She shook her head. She laid her hand on his human part.

"No," she said. "I will not be ready."

"How can you tell, now?"

"I made a mistake," she said. "I should never have come here."

He halted and regarded her.

"That is unfortunate," he said. "The best thing that I can recommend is to go and speak with the therapists at the Center. They will find a way to persuade you that peace is preferable to distress."

"They were never able to persuade you," she said.

"I am different. The situation is not comparable."

"I do not wish to die."

"Then they cannot take you. The proper frame of mind is prerequisite. It is right there in the contract—Item Seven."

"They can make mistakes. Don't you think they ever make a mistake? They get cremated the same as the others."

"They are most conscientious. They have dealt fairly with me."

"Only because you are virtually immortal. The machines short out

in your presence. No man could lay hands on you unless you willed it. And did they not try to dispatch you in a state of unreadiness?"

"That was the result of a misunderstanding."

"Like mine?"

"I doubt it."

He drew away from her, continuing on down the beach.

"Charles Eliot Borkman," she called.

That name again.

He halted once more, tracing lattices with his stick, poking out a design in the sand.

Then, "Why did you say that?" he asked.

"It is your name, isn't it?"

"No," he said. "That man died in deep space when a liner was jumped to the wrong coordinates, coming out too near a star gone nova."

"He was a hero. He gave half his body to the burning, preparing an escape boat for the others. And he survived."

"Perhaps a few pieces of him did. No more."

"It *was* an assassination attempt, wasn't it?"

"Who knows? Yesterday's politics are not worth the paper wasted on its promises, its threats."

"He wasn't just a politician. He was a statesman, a humanitarian. One of the very few to retire with more people loving him than hating him."

He made a chuckling noise.

"You are most gracious. But if that is the case, then the minority still had the final say. I personally think he was something of a thug. I am pleased, though, to hear that you have switched to the past tense."

"They patched you up so well that you could last forever. Because you deserved the best."

"Perhaps I already have. What do you want of me?"

"You came here to die and you changed your mind—"

"Not exactly. I've just never composed it in a fashion acceptable under the terms of Item Seven. To be at peace—"

"And neither have I. But I lack your ability to impress this fact on the Center."

"Perhaps if I went there with you and spoke to them . . ."

"No," she said. "They would only agree for so long as you were about. They call people like us life-malingerers and are much more casual about the disposition of our cases. I cannot trust them as you do without armor of my own."

"Then what would you have me do—girl?"

"Nora. Call me Nora. Protect me. That is what I want. You live near here. Let me come stay with you. Keep them away from me."

He poked at the pattern, began to scratch it out.

"You are certain that this is what you want?"

"Yes. Yes, I am."

"All right. You may come with me, then."

So Nora went to live with the Bork in his shack by the sea. During the weeks that followed, on each occasion when the representatives from the Center came about, the Bork bade them depart quickly, which they did. Finally, they stopped coming by.

Days, she would pace with him along the shores and help in the gathering of driftwood, for she liked a fire at night; and while heat and cold had long been things of indifference to him, he came in time and his fashion to enjoy the glow.

And on their walks he would poke into the dank trash heaps the sea had lofted and turn over stones to see what dwelled beneath.

"God! What do you hope to find in that?" she said, holding her breath and retreating.

"I don't know," he chuckled. "A stone? A leaf? A door? Something nice. Like that."

"Let's go watch the things in the tidepools. They're clean, at least."

"All right."

Though he ate from habit and taste rather than from necessity, her need for regular meals and her facility in preparing them led him to anticipate these occasions with something approaching a ritualistic pleasure. And it was later still after an evening's meal, that she came to polish him for the first time. Awkward, grotesque—perhaps it could have been. But as it occurred, it was neither of these. They sat before the fire, drying, warming, watching, silent. Absently, she picked up the rag he had let fall to the floor and brushed a fleck of ash from his flame-reflecting side. Later, she did it again. Much later, and this time with full attention, she wiped all the dust from the gleaming surface before going off to her bed.

One day she asked him, "Why did you buy the one-way ticket to this place and sign the contract, if you did not wish to die?"

"But I did wish it," he said.

"And something changed your mind after that? What?"

"I found here a pleasure greater than that desire."

"Would you tell me about it?"

"Surely. I found this to be one of the few situations—perhaps the only—where I can be happy. It is in the nature of the place itself: departure, a peaceful conclusion, a joyous going. Its contemplation here pleases me, living at the end of entropy and seeing that it is good."

"But it doesn't please you enough to undertake the treatment yourself?"

"No. I find in this a reason for living, not for dying. It may seem a warped satisfaction. But then, I am warped. What of yourself?"

"I just made a mistake. That's all."

"They screen you pretty carefully, as I recall. The only reason they made a mistake in my case was that they could not anticipate anyone finding in this place an inspiration to go on living. Could your situation have been similar?"

"I don't know. Perhaps . . ."

On days when the sky was clear they would rest in the yellow warmth of the sun, playing small games and sometimes talking of the birds that passed and of the swimming, drifting, branching, floating and flowering things in their pools. She never spoke of herself, saying whether it was love, hate, despair, weariness or bitterness that had brought her to this place. Instead, she spoke of those neutral things they shared when the day was bright; and when the weather kept them indoors she watched the fire, slept or polished his armor. It was only much later that she began to sing and to hum, small snatches of tunes recently popular or tunes quite old. At these times, if she felt his eyes upon her she stopped abruptly and turned to another thing.

One night then, when the fire had burned low, as she sat buffing his plates, slowly, quite slowly, she said in a soft voice, "I believe that I am falling in love with you."

He did not speak, nor did he move. He gave no sign of having heard.

After a long while, she said, "It is most strange, finding myself feeling this way—here—under these circumstances . . ."

"Yes," he said, after a time.

After a longer while, she put down the cloth and took hold of his hand—the human one—and felt his grip tighten upon her own.

"Can you?" she said, much later.

"Yes. But I would crush you, little girl."

She ran her hands over his plates, then back and forth from flesh to metal. She pressed her lips against his only cheek that yielded.

"We'll find a way," she said, and of course they did.

In the days that followed she sang more often, sang happier things and did not break off when he regarded her. And sometimes he would awaken from the light sleep that even he required, awaken and through the smallest aperture of his lens note that she lay there or sat watching him, smiling. He sighed occasionally for the pure pleasure of feeling the rushing air within and about him, and there was a peace and a pleasure come into him of the sort he had long since relegated to the realms of madness, dream and vain desire. Occasionally, he even found himself whistling.

One day as they sat on a bank, the sun nearly vanished, the stars coming on, the deepening dark was melted about a tiny wick of falling fire and she let go of his hand and pointed.

"A ship," she said.

"Yes," he answered, retrieving her hand.

"Full of people."

"A few, I suppose."

"It is sad."

"It must be what they want, or what they want to want."

"It is still sad."

"Yes. Tonight. Tonight it is sad."

"And tomorrow?"

"Then too, I daresay."

"Where is your old delight in the graceful end, the peaceful winding-down?"

"It is not on my mind so much these days. Other things are there."

They watched the stars until the night was all black and light and filled with cold air. Then, "What is to become of us?" she said.

"Become?" he said. "If you are happy with things as they are, there is no need to change them. If you are not, then tell me what is wrong."

"Nothing," she said. "When you put it that way, nothing. It was just a small fear—a cat scratching at my heart, as they say."

"I'll scratch your heart myself," he said, raising her as if she were weightless.

Laughing, he carried her back to the shack.

It was out of a deep, drugged-seeming sleep that he dragged himself/was dragged much later, by the sound of her weeping. His time-sense felt distorted, for it seemed an abnormally long interval before her image registered, and her sobs seemed unnaturally drawn out and far apart.

"What—is—it?" he said, becoming at that moment aware of the faint, throbbing, pinprick aftereffect in his biceps.

"I did not—want you to—awaken," she said. "Please go back to sleep."

"You are from the Center, aren't you?"

She looked away.

"It does not matter," he said.

"Sleep. Please. Do not lose the—"

"—requirements of Item Seven," he finished. "You always honor a contract, don't you?"

"That is not all that it was—to me."

"You meant what you said, that night?"

"I came to."

"Of course you would say that now. Item Seven—"

"You bastard!" she said, and she slapped him.

He began to chuckle, but it stopped when he saw the hypodermic on the table at her side. Two spent ampules lay with it.

"You didn't give me two shots," he said, and she looked away. "Come on." He began to rise. "We've got to get you to the Center. Get the stuff neutralized. Get it out of you."

She shook her head.

"Too late—already. Hold me. If you want to do something for me, do that."

He wrapped all of his arms about her and they lay that way while the tides and the winds cut, blew and ebbed, grinding their edges to an ever more perfect fineness.

I think—

Let me tell you of the creature called the Bork. It was born in the heart of a dying star. It was a piece of a man and pieces of many other things. If the things went wrong, the man-piece shut them down and repaired them. If he went wrong, they shut him down and repaired him. It was so skillfully fashioned that it might have lasted forever. But if part of it should die the other pieces need not cease to function, for it could still contrive to carry on the motions the total creature had once performed. It is a thing in a place by the sea that walks beside the water, poking with its forked, metallic stick at the other things the waves have tossed. The human piece, or a piece of the human piece, is dead.

Choose any of the above. ■

July 3-July 7, 1974:
WESTERCON 27 (West Coast SF Conference), at the Francisco Torres, Goleta, California. Guest of Honor, Philip K. Dick; Fan Guest of Honor, Charles Burbee. Registration: supporting $3; attending $5 until June 1, 1974, $6 thereafter; children, $2. Info: Westercon 27, Post Office Box 1, Santa Monica, California 90406.

July 3-July 12, 1974:
SF Writing Workshop (Judith Merril), Toronto. Info: Director of University Extension, University of Toronto, 119 St. George Street, Toronto, Ontario, Canada.

July 5-July 7, 1974:
BENECIA I (Star Trek and SF-oriented Conference). Info: Steve D. Reed, 2470 Sandtown SW, Marietta, Georgia 30060. (Include a self-addressed, stamped envelope.)

August 29-September 2, 1974:
DISCON II (32nd World Science Fiction Convention) at the Sheraton-Park, Washington, DC. Guest of Honor, Roger Zelazny; Fan Guest of Honor, Jay Kay Klein. The SF Achievement Awards (Hugos) will be presented. Info: Discon II, Box 31127, Washington, DC 20031.

October 31, 1974:
Deadline for entries in the New England SF Association science fiction short story contest. Info: NESFA, Box G, MIT Branch, Cambridge, Massachusetts 02139. —Anthony R. Lewis

STARGATE

Part Two of Three Parts.

It's difficult to compete against someone when you don't know what he's after, or how he intends to get it.

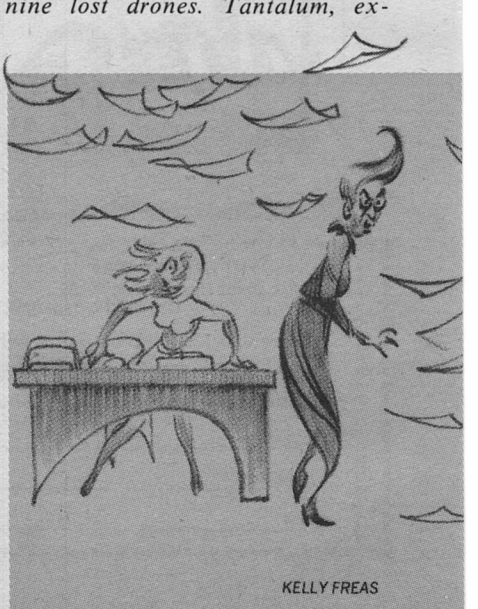
TAK HALLUS

SYNOPSIS

Me? I'm Robert Collins, Chief Project Engineer on the space station Merryweather Enterprize. *Mr. Merryweather hired me to finish the matter transmitter his previous project engineer, the late Dr. Norton, was building in solar orbit out near Mars. Twenty-eight, a moderately shiny PhD in Design Engineering plus a couple of years unrelated experience—and he still hired me. Phillip Duff, Mr. Merryweather's accountant and man Friday, opposed it—Collins was too young and the project itself too expensive. I opposed it too—my knees shaking at the thought of managing a ten-billion-dollar annual budget with one hand and trying to match Dr. Norton's inspired engineering with the other. Badgered by my girl friend, Dolores Gomez, I gave in. It was a challenge, my first real break as an engineer. If I could do it, I could do anything, almost.*

Problems ensued, problems unrelated to my new job. The late Dr. Norton's body disappeared. His wife, Sharon, unable to restrain herself at his funeral, pried up the lid of the closed casket. No Norton.

Mr. Merryweather sent Duff and me out to hire Scarlyn Smith, a retired troubleshooter, to find Norton. He also wanted to know if Frederick Spieler, his prime competitor, was involved. Spieler, the thirty-nine-year-old-financial-whiz-kid-billionaire owner of Spieler Interstellar, runs a drone mining fleet. It uses modified matter transmitter principles to get across the galaxy and is extremely unstable. One shipload of niobium ore, even if it takes an eight-year round trip at sub-light-speeds to obtain, will easily pay for nine lost drones. Tantalum, ex-



KELLY FREAS

tracted from niobium ore, is used to construct matter transmitter focusing rings, among other things. The demand is almost insatiable.

Duff and I found Smith—seventy-five, though he looked a healthy sixty—living with his daughter and her banker husband, H. Winton Tuttle—"Harold," to Smith. Smith refused the job. Duff convinced him to at least think about the offer.

At home that night, a salesman named Parry called me, trying to make an appointment for the following Saturday morning. I refused. Immediately afterward, Smith called, bubbling with orders for me. He had changed his mind. I was supposed to correlate Dr. Norton's phone calls from the space station with his progress reports on the Big Gate. Norton, who kept everything in his head, had left only the progress reports. I did the correlation, discovering a recent call from Parry. Smith sent me off to lunch with Parry, informing me that Fenton Laser Products, Parry's employer, was owned by Spieler Interstellar.

During an excellent meal and rot-

ten music—a German oom-pah band—Parry tried to bribe me. How much? How much, indeed! Not mere money, but fame! If only I would give him construction updates on the Merryweather Big Gate, he would get me laser innovations for the Gate power supply that I could pass off as my own ideas.

I told Smith. He wanted me to string along with Parry, but to be careful about any information.

The next Tuesday, I got my first visit to the Merryweather Enterprize. *Technicians put Smith and me into spacesuits, preparing us for the matter transmitter trip to the space station, accomplished through a string of satellite relays. While we were waiting to use the Gate, Smith got word Norton was turning up, piece by piece, a liver here, a kidney there. Someone had fed the body into a partially spray-focused matter transmitter.*

Suited up, we took the elevator to the transfer surface. I asked Smith whether he had his cigar in the helmet with him. Before he could answer, the Gatekeeper thumped my helmet. I stepped through the shimmering air.

Part 2

VII

"Yep," answered Smith, stepping through behind me.

What did I expect? Sudden weightlessness? Perhaps. I lumbered forward in Corona del Mar and finished lumbering near the orbit of Mars. I remember reading about Neil Armstrong. One small step. What did he know about it?

"Yep what?" I asked.

"Yep, I got my cee-gar in here."

The shimmering air behind me disappeared. In front of me, Captain Wilkins—every inch the captain; there was no mistaking him—silently mouthed a conversation with the station Gatekeeper. The technician nodded and walked toward me, reaching for my helmet. Captain Wilkins touched an intercom plate. The suitphone popped.

"As soon as we get you out of that suit, I'll give you the grand tour, Mr. Collins."

"We" meant the Gatekeeper. Captain Wilkins, probably from seeing too many movies about spacecraft commanders, watched, hands behind his back, legs firmly planted on the deck, his expression, between his distinguished gray sideburns, resolute. With the station in permanent orbit, Captain Wilkins had little to do but look resolute.

Out of the suits, we followed Captain Wilkins. He led us from room to room, doggedly explaining everything in sight, intercoms, plumbing, station policy on food in the rooms. The station, a standard wheel construction a half-mile across, seemed endless. Even the slightly reduced "gravity," caused by the rotation of the wheel, added little to the speed of the tour.

After the first few rooms, identi-

cal to offices and workshops on Earth, I began to fade out. I was still interested, but you can only absorb so much information at once. Try seeing *all* the Louvre in one day. I followed the drone of Captain Wilkins' monotonous voice rather than the content. How many times had he given this tour to visiting VIP's? Too many. The spontaneity had long since died from his lecture.

Smith nudged me.

"Wake up, buddy boy. You're gonna walk into a wall."

"Bulkhead." I remembered that much. The walls were bulkheads.

"Looks like a wall to me."

I grunted something exculpatory. I felt sure we had circled the station twice. Captain Wilkins must have noticed my glazed expression. I noticed his disapproval, both of my inattention and of me, personally. I was half his age. Obviously a man half his age was incapable of commanding a boy with an erector set, much less the Big Gate construction.

"Mr. Collins," said Captain Wilkins, halting the tour, "if you find this too much of a burden, we can postpone—"

"Let's get the damn thing over with, Willis."

"Wilkins."

"Sorry."

Watching us, Smith grinned. He had detected the hostility between Captain Wilkins and me. The tour proceeded.

Only in the control room did I feel something of what I expected, awe and excitement. I revived quickly. Three walls of equipment, computer displays, oscilloscopes, assorted screens and winking readouts, gave way to a fourth wall, transparent and stunning. I walked toward it, mounting the low observation platform. I stopped when the equipment disappeared from my peripheral vision. Stars, constant pinpricks of light on a black field, stared at me. I felt none of the acrophobia I had in Corona del Mar. Looking at a forty-foot drop can make you queasy. Looking at millions of miles of "drop" is meaningless.

On a clear winter night you might feel what I felt, a sense of perspective, a sense of direct confrontation with man's insignificance.

"Sure is a hell of a lot of it," said Smith, next to me.

"What?"

"Space."

I nodded. A hell of a lot of it and more.

To our left, the Big Gate focusing ring came into view, a nearly completed "O" of solid tantalum. It floated, catching the sunlight from behind us, its apparent diameter no more than a quarter of an inch. From time to time, light reflected from specks near the incomplete section of the "O." I pointed at the ring.

"That's it."

Smith looked, squinting. "What's that dust where the ends meet?"

"Dust?"

"Those shiny specks." He pointed. "There's one."

Light flared and faded from a speck. I turned to Captain Wilkins. "Captain, is there someplace we can get a closer look at the ring?"

"Your office."

My office, located near the station's own Gate, looked as bare as the one I left at Standard Engineering. Captain Wilkins touched a plate next to my built-in desk. One wall of the office came alive with screens. I watched, fascinated. Each screen showed a different angle or distance from the ring. I pointed at a close-up screen. A two-man constructor, its hydraulic arms extended, maneuvered for position, preparing to weld a coupling to the incomplete stub of the Gate.

"See that?"

"Yep."

"That's your speck of dust."

Smith's forehead wrinkled, struggling with the jump in scale. I could appreciate his difficulty. Intellectually I knew the size of the Big Gate, but seeing it was disconcerting. For a fifteen-kilometer projection surface, the ring had to be a hundred and eighty kilometers in diameter. The tantalum alone, cast section by section in space, cost over a billion dollars.

Smith looked from screen to screen, absorbing the sight. "What's old Horace going to do with that hole?"

Captain Wilkins coughed on the word *Horace.*

"Hole's a good description," I said. "Mine shaft's a better one."

"Mr. Collins," interrupted Captain Wilkins, pronouncing my name with the long-suffering weariness of a man being patient with a child. "Is Mr. Smith cleared for—"

I decided it was time to establish my relationship with Captain Wilkins. If his disapproval gelled into a permanent attitude, condescending and barely tolerant, I would have trouble. He had two choices. We were equals or he got off the merry-go-round.

"Captain, Mr. Smith is cleared for *any*thing. Do you understand?" He sensed something in my tone and looked startled. "You can check it with Hor—I mean, Mr. Merryweather. If Smith says to junk this station, you ask when."

"Junk my—"

"If he says spit to windward, you spit!"

"There isn't any windward on a—"

"There's a solar wind, isn't there?"

"Yes, but—"

"*No* buts. If Smith says spit, spit! Got it?"

"Yes, but—"

"I'll talk to you later, Captain Wilkins."

Bewildered, Captain Wilkins left, muttering something about Norton

and reincarnation. Smith grinned at me.

"What's your problem?" I snapped.

"No problem."

"Then get that silly grin off your face."

"Aye, aye, sir." He kept grinning.

"Just *what* is so damned funny, Smith?"

"You."

"What about me?"

"You may fill old Norton's shoes yet. *He* was a real son-of-a-bitch."

The rest of the day, I familiarized myself with the state of construction. Smith wandered off on errands of his own. Rodriguez, the ring construction boss, proved competent and efficient, though irritated at being called away from the job to report. Ring construction would be complete in two weeks.

Burgess, the electronics engineer in charge of the transmitter itself, was less efficient. I read through his daily work reports, hoping to find some sign of progress. Since Norton's death, Burgess had marked time. I found his number in the company directory and punched it up. A man about forty years old appeared on the screen, staring blankly at me, his wide face, bulbous nose and weak chin close to the camera.

"Mr. Burgess, please."

"Speaking."

"I'm Collins. I've just been going over your reports. What seems to be the problem?"

"Which problem, Dr. Collins?"

"The transmitter. Your reports don't show any progress for the past three weeks."

"Sir, we're doing the best we can." He paused, uncertain whether to add anything. "Under the circumstances."

"What circumstances?"

"May I see you in your office, Dr. Collins?"

"Sure. Ten minutes, OK?"

"I'll be there."

Waiting for him, I digested his reports. The integration equipment, completed before Norton's accident, floated in space a mile from the focusing ring. The transmitter's modulator, its most critical and expensive section, lay in pieces separated by twenty million miles, kleistronisters and reconstitution modules spread from Burgess' assembly rooms on the station to the Merryweather plant in Osaka, Japan. The stabilization computer, incorporating Norton's phase-shift program, was on order from Master Toole in San Francisco. The order, actually a purchase option, had four days to run. At the end of the four days, Master Toole could pocket the half-million-dollar option price without doing a lick of work. Nice—for them. If we finalized the purchase by picking up the option, an operative computer had to be on board the *Merryweather Enterprize* within thirty days.

Burgess came into the office, glancing around apprehensively. Tufts of graying hair, disarrayed, sprouted above his ears and collar, accenting his bald head. On the screen, he had appeared heavy. In person, only his face seemed large, supported by a thin body.

"Sit down, Mr. Burgess."

He sat down, assured himself we were alone, then leaned across the desk, eyes glancing from side to side. His air of conspiracy made me smile.

"Dr. Collins."

"Yes."

"Something has to be done."

"About what?"

"Dr. Norton *never* would have allowed it."

"What?"

"Shhh. He's got spies *everywhere*."

"Who?"

"Shhh."

I whispered. "Who?"

"Duff."

Duff? I laughed. The idea of Duff with a network of spies, coldly masterminding some nefarious plot, had a genuine comic flavor.

"This is no joke, Dr. Collins."

I tried to appear sober. "Exactly what is it that isn't a joke?"

"Duff. He's out to ruin this project."

"I hardly think—"

"You—" he began too loud, then lowered his voice, glancing over his shoulder. I made a mental note to check Burgess' psychological profile in personnel. "You have no idea the lengths that man will go to. Dr. Norton knew. Oh, *he* knew, Dr. Collins. *We* fought Duff tooth and nail, hand and claw—"

"Hoof and mouth?"

Startled, his eyes narrowed, examining my face. Who was I with? Him? Duff? "Joke if you like, Dr. Collins. Duff is out to get us, you and me. He does not want this Gate finished. He wants a drone fleet instead." He lowered his voice even further. "I can only speculate about his reasons."

"Speculate for me."

"I'd rather not."

"Please do."

"It is said—"

"Could you speak up, Mr. Burgess? I'm having trouble hearing you."

"It is said," repeated Burgess, only slightly more audibly, "that Duff has invested heavily in"—he broke off, unable to bring the words to his lips—*"them."*

"Spieler Interstellar."

His index finger flew to his lips. "Shhh!"

"Them;" I whispered.

"Yes. When we go under, it is said that Duff will be in charge of picking our bones."

"It all sounds very sinister."

"It *is,* Dr. Collins. Sinister and more. It is treachery of the meanest kind. And treason of the most despicable type!" He pronounced "despicable" with a "z." "And . . .

and"—his voice faltered, returning to the whisper—"and more."

"More?"

"Much more."

"Do you have any evidence of—"

Burgess' arms spread, indicating the space station with an all-encompassing gesture. "It's *all* around us!"

"Everywhere?"

"*Every*where!"

"For example."

He noticed the reports on my desk. He leaned forward and stabbed at them with his scrawny index finger. "There! There is an example!"

"Your reports?"

"No. The computer option! We cannot go one inch further without that computer, yet *he* refuses to pick up the option!"

Suddenly, I took Burgess seriously. Duff did want a drone fleet instead of the Gate. Almost the first words I heard from him expressed disapproval of Norton's Gate. He considered the Gate an economic folly. Still, a simple failure to pick up a computer option was inconclusive, no matter how it hindered the project. It could have been an oversight.

"When was the last time you talked to Duff about it?"

Burgess looked incredulous. "Talk to him? If the man were in this room, I would not talk to him."

"How do you know he stopped the option?"

He looked exasperated. "The day after Norton's death, a directive over *his* signature arrived. All options still open on the Gate project would remain open until further notice. We *have* to do something, Dr. Collins. Renegotiating with Master Toole will take six months or more. The financial impact will be *fatal!"* His eyes gleamed.

I looked up Duff's number and punched it into the phone. His secretary, a hawk-faced woman, answered. "Mr. Duff's office."

"May I speak to Mr. Duff."

"Who's calling, please?"

"Dr. Collins." The "doctor" impresses secretaries. She remained unimpressed, eyeing me suspiciously.

"Impossible."

"Pardon me?"

"Dr. Collins is a much older man. I don't know what sort of joke this is, but—"

"Tell him," I said, realizing she was about to hang up. The grapevine had evidently aged me substantially before she got the word. "Tell him it's about Sharon Norton."

She looked at me, doubtful. "Very well, sir. Hold, please." The screen went blank.

Burgess looked at me. "Sharon Norton?"

"First, we have to get his attention."

Almost immediately, Duff, apprehensive, came on the screen. When

he saw me, his expression relaxed. "Ah, it's you."

"Yes, it's me. And would you *please* tell that old crow you call a secretary who I am?"

"Sorry. What can I do for you?"

I explained about the option, emphasizing the remaining four days. Duff listened, nodding at the camera. Yes, yes, he had heard it all before.

"Mr. Collins," began Duff, "one does not simply go out and *purchase* a fifty-million-dollar computer without careful planning and thought. I—"

"I've thought about it," I said. "I want it."

"Be reasonable, Mr. Collins. These things take time and—"

"Now."

Duff's expression hardened. "Norton used to talk to me in that tone of voice."

"Is that a threat?"

"No."

It was a threat. He knew it. I knew it. It angered me.

"I don't give a *damn* how Norton used to talk to you. If he did, I can see why. Obstruction like this—"

"I would hardly call it obstruction."

"What *would* you call it?" I could feel my cheeks reddening.

"Prudence. Have you read the computer contract?"

"No."

"It calls for transfer of the entire fifty million on the date the option is exercised. Why give them our money, which can be used in other areas, until absolutely necessary? Four days' interest on that money alone approaches thirty thousand dollars. This is strictly a business matter, Mr. Collins. You will have to leave it to—" I hung up.

"You *see,* Dr. Collins," said Burgess. "From his *own* mouth."

I found Mr. Merryweather's secretary in the directory and called. She put me through to Mr. Merryweather.

"Mr. Collins. I was meaning to call you today. Are you getting settled in?"

"Unsettled is more like it." I explained about the computer, the option, and Duff, omitting only Burgess' suggestion of ulterior motives. Mr. Merryweather listened quietly, nodded, his face impassive. When I finished, he spoke immediately.

"When do you want it?"

"As soon as possible. It should have been here already."

"I'll have Phillip exercise the option today. How's Scarlyn doing?"

"Who?"

"Mr. Smith."

"Fine, I suppose. I haven't seen him since this morning. He's around here someplace."

Mr. Merryweather laughed. "You're sure about that."

"Reasonably. Why?"

"Scarlyn gets around. If there's nothing else—"

"Thank you, sir." He hung up.

Burgess left the office beaming,

sure of an ally in his hoof-and-mouth struggle with Duff.

I looked for Smith on the way home. The Gatekeeper told me he went through around noon, Los Angeles time. I suited up and stepped through, too tired to worry about Smith or even be anxious about the transmission. I was drained. Most of the day, I felt inefficient. New jobs are always the same. More wheel spinning than traction. I had a document viewer in my coat pocket and the depressing prospect of an evening staring at it ahead of me.

I picked up my suitcases at the Merryweather Building and juggled them home on the monorail, imagining the effect my unexpected appearance would have on Dolores. I envisioned her alone at the kitchen table, crying into a plate of cold beans, unable to eat, in despair at my absence. I would walk in—ta-ta, it is I! She would bounce with joy.

When I got there, she was neither crying nor bouncing. The kitchen table was set for two, candle flames flickering romantically over a small roast—surrounded on its platter by glazed carrots and sprigs of parsley. I dropped the suitcases on the floor. They clattered and toppled.

"*What,*" I inquired, using my most tactful shout, "the hell is *this?*"

"Bobby—"

"*One* day I'm gone"—I held up one finger, shaking it—"*one* lousy day and *you're* having cozy little candlelight dinners!"

"Bobby—"

" 'Oh, Bobby, don't leave,' " I mimicked. "And two seconds after old Bobby's gone, you're out hustling a tryst!"

"What does that mean?"

"You and the night and the pot roast, that's what it means! Just the two of you with nasty old Bobby out there in space!"

"Bobby, it's not what—"

"It isn't, huh? Then what is it?" She started to tell me. I interrupted. "I'll tell you what it is! A little action on the side!"

"Please, Bobby, let me—"

"We may not be married, but I *do* have a few rights, you know!"

Her expression changed. Instead of a plaintive desire to explain, it showed indignation. "Oh?"

"Yes! You eat *my* food"—I jabbed at my chest with my thumb—"and live in *my* house, so—"

"So I'm *yours,* huh? Fee simple absolute!"

"What does that mean?"

She flapped her hand at the food on the table. The puff of air extinguished a candle. "You know where you can put *your* food and *your* house! I'm taking *my* suitcase and getting out!"

She hoisted one of the suitcases and carried it into the bedroom with both hands, listing under its weight. I heard the snaps click and

my things crash to the floor.

Getting out? *My* Dolores? Hasty. Yes. Perhaps I had been a little hasty. I followed her into the bedroom, stepping over a pile of my shirts. Pungent scent rose from a broken bottle of after-depilatory.

"Dolores."

"What?" she growled, dumping a drawer full of underwear into the suitcase. She discarded the empty drawer, throwing it against the dresser. It banged and clattered. Dolores, though small, gets violent. One of these days I'll probably wake up with an enchilada through my heart. I tried to sound humble.

"Maybe I *was* a little hasty," I said. "You had some kind of explanation."

"Who wants to explain anything to you, you hypocrite!"

"Hypocrite?"

She glared at me. "All the time, I thought this was a joint venture, *our* house, *our* food, *our* life! All the time, I thought you agreed! 'Dolores, don't we have a good life together?' But inside"—she tapped her temple violently; her head recoiled from the blow—*"you* were thinking, *Mine! Mine! Mine!* You hypocrite!"

"Dolores."

"Don't talk to me."

"Please, Dolores, who was the extra plate for?"

"You," she muttered.

"Who?"

"You, you hypocrite."

"Me? How did you know—"

"That old man came around this afternoon."

"Smith?"

"Yes!"

"What did he want?"

"Don't talk to me." She slammed the suitcase shut and snapped one hasp.

I backed into the hall. I heard her coming, bare feet thumping on the floor. Evidently, she planned to leave without her shoes. I blocked her way at the front door, spread-eagled. She stopped, looked at me, forehead severely wrinkled, and hefted the suitcase, securing her grip. I had the distinct impression she intended to butt me in the stomach. She raised her head and looked at me again. I continued my crucified martyr posture. Finally, she got the point. She remembered blocking my way that morning, using the same pose. Her determination broke. She tried to suppress a smile and failed, giggling.

"Did I look like that?"

"Yes."

She giggled again. I walked to her and put my arms around her. The suitcase banged my shins.

"Bobby."

"What?"

"I don't like fighting with you."

"I don't either."

She put the suitcase down and towed me into the bedroom. She pulled me down on the bed.

"Bobby."

"What?"

"You're not really a hypocrite, are you?"

"No, dear."

The doorbell chimed.

"Go 'way," I said, warming to my task.

It chimed again. Reluctantly, I got up. I straightened my suit and went to the door, opening it.

"Hiya, buddy boy. What's for dinner?"

We fed Smith, watching him devour half the roast. He talked incessantly, stabbing carrots and dissecting beef, complimenting Dolores on the food, me on Dolores and himself on his appetite.

"Pretty good," he said, sitting back from his empty plate, "for an old man. I can still put it away with the best of them."

"Do you always eat like that?"

"Only when I'm working."

"When you're not working, you eat like a sparrow."

"Actually, it just tastes better when I'm working."

Dolores placed a scooner of butterscotch ice cream in front of him.

"Gracias."

"De nada."

"Why did you come by this afternoon?" I asked.

He puckered around the cold ice cream. "No stone unturned and all that."

I started to protest. The idea of Smith investigating *me* was incredible. Robert Collins, shifty-eyed superspy. I have enough trouble just being a shifty-eyed engineer. Smith waved his spoon at me, stifling my protest until he could swallow his ice cream.

"You're clean."

"I am?"

"Yes."

"Glad to hear it."

Smith concentrated on his ice cream. Stuffed, I ate mine slowly, thinking about him. The more I thought, the less I understood. Seventy-five, retired, reluctant to accept this job, then suddenly eager. Mr. Merryweather thought him indispensable. Duff thought him a menace. What did I think? I didn't know.

I asked him why he took the job.

"I told you. It's better than feeding pigeons."

"You don't like pigeons?"

"Nope. Lazy birds." He finished his ice cream and pulled out a cigar. "Mind if I smoke?"

"Go ahead. You weren't going to take the job when Duff and I talked to you."

"Changed my mind." He found a match, struck it, lit the cigar and puffed.

"Why?"

"Bobby," said Dolores, sitting down and turning on the coffee pot, "it's really none of your business."

"If *he* can go around sticking his nose in *my* business, *I* can ask a few questions, can't I?"

"He," answered Dolores, "gets

paid to stick his nose in your business."

"She's got you there, buddy boy."

I grunted. "Have you been sticking your nose in Duff's business?"

"He's clean, too."

"You're sure."

"Other than a little fooling around with Sharon Norton, yes."

I told him about Burgess' accusation.

"*That* paranoid!"

"He's only paranoid if no one's actually after him."

"True. But Duff's still clean. The only stock Duff owns, other than Merryweather stock, is two shares of Pan Am he got from an aunt—worth, broadly speaking, a penny and a half. They say Pan Am's going up, though. Souvenir value. Duff's persnickety—that may look subversive to a mind like Burgess'—but he's loyal to Horace."

"Duff once said something about you almost 'getting' him. He showed me a scar you gave him on his eyebrow. What was that all about?"

"Duff is a very cautious man. He got the scar because I told him to move and he asked why. Prudent men ask why. Sometimes fools ask why. If I'd been slower, we wouldn't be worrying about old Duff at all." He pulled up his left shirtsleeve. A half-inch scar creased the top of his forearm. "See this?"

"Yes."

"The bullet would have been in Duff's head." Smith grinned. I imagined Smith's arm outstretched, knocking Duff aside, the bullet cutting through Smith's arm.

"He didn't seem too grateful."

"He thought I liked doing it."

"Did you?"

"Enough of this nostalgia, my boy. Let's adjourn to the living room."

We adjourned. Smith sat in my easy-chair. I sat on the couch. Dolores brought coffee and sat next to me. Momentarily, watching Smith smoke, his long legs crossed on the ottoman, I felt *I* was visiting *him.*

"Can I ask you something, Scarlyn?"

"Sure." He puffed. A cloud of smoke accumulated above his head.

"We're glad to have you, but why did you—"

"Invite myself to dinner?"

"Yes."

"One, I wanted to see if you dug up anything today."

"You could have done that by phone."

"True. But I'm *persona non grata*"—he nodded his head in the general direction of Seal Beach, pointing over his shoulder with the butt of his cigar—"over there."

"At your daughter's."

He grunted, his voice momentarily serious. "Yes. My daughter's."

"What happened?"

His smile returned, his expression that of an old imp. "You send children to their room when they're bad, don't you?"

"Yes, I guess you do."

"What if they won't go?"

"You make them go."

"What if you can't?"

"I don't know. What?"

"You get mad at them, right?"

I nodded.

"Persona non grata."

"I can't imagine anyone treating you like a child."

"You don't know Harold and my so-called daughter." He thought a moment, looking at me. "I like you, buddy boy."

"Thanks."

"It's true. Even if you do browbeat your girl friend."

"Browbeat!"

"I could hear you all the way from the curb."

Dolores blushed. I glanced out the window. Smith's red Ferrari stood at the curb.

"Do you want to know why I took this job? I'll have to give you a little background first."

I nodded.

"When you and Duff came to see me on the beach, I *was* retired. I've been retired for ten years. I could have retired at forty. I had the money." He looked at me, unsure if I thought he was bragging. I knew he was just stating facts. "I had the money, but what do you do then?"

"Feed pigeons?"

"Right. Looks a little silly, doesn't it? Shuffleboard and cribbage at forty. So I kept at it."

"At what?"

"This kind of thing I'm doing now. Special jobs. One of my first jobs was for Horace's father. Back in 1970. Someone was systematically looting the Conquistador Hotel in Acapulco. Homer Merryweather hired me. I got a free trip to Acapulco, expense account, and one order—find the guy who was doing it. I found him. He just about found me first." Smith laughed. "Mean devil, he was. Anyway, I got back to Los Angeles and I started thinking. Scar, I thought, you've got to do something with yourself. Times are changing. Things are quieting down. This Acapulco business went pretty well. Why don't you go into that line of work permanently? True, it couldn't match the social significance of Berkeley, but—"

"You went to Berkeley."

"Bachelor of Arts, '68, history. Master's, '70, criminology. I got the job with Horace's father because of the Master's." He leaned back in the chair, looking at the ceiling above our heads, remembering. "Berkeley in the Sixties was one hell of a place to be. We brought down governments and turned the world around. Good times. I met Molly there."

"Molly?"

"My wife. Good old girl." He shook his head from side to side. "Fifteen years since I lost her. It seems like only—" He looked at Dolores and me. His face had lost the hard old man quality. "Never

mind. On with my tale. The times changed. I didn't. The war was over—"

"Korea?"

"Vietnam. And I realized I liked all the action. I hated the war, mind you. At the time, I wanted it over and things back to 'normal'. I was not doing it because I was having one hell of a good time, I told myself. Who, after all, *likes* being on the wrong end of tear gas and billy-clubs? It was *all* idealism, not kicks. A lot of it *was* idealism. But some of it was kicks. I liked the turmoil. Then things changed. There wasn't much need for billy-club-scarred veterans of the peace movement. After Acapulco, I realized I liked the excitement. Wouldn't you?"

"I wasn't there."

"True. I was, buddy boy, and it was the best time in the world."

"Everyone's youth is."

"True again. I had done the job for Horace's father. Horace was just a kid at the time. I kept at it, that sort of job. It's been"—he hesitated, searching for the right word—"interesting."

"What does this have to do with—"

"Background. I told you we'd need a little background. I could have quit at forty. I collected what I thought was my last fee the day before my fortieth birthday. One million dollars. In 1985, that still meant something."

"It still does."

"I decided, to hell with it. I liked the work. It was the only thing I knew how to do anyway. If somebody nailed me, I'd leave a rich widow. Molly understood. She always understood. Even when I lost her, I kept working. I sold the house. Janet—that's my alleged daughter—wanted me to live with them. Someplace along the line Molly and I went wrong with Janet. She's got none of her mother in her and less of me. She married the banker—"

"Harold."

"Yes. She married him and got worse. Money, status, security—do you realize that *no* one uses the front room in that house? No one. She wants to keep it neat in case any of the Rotary wives drop by." He shivered visibly. "Makes me sick just thinking about it."

"Why did you move in?"

"Julia. She was following right in her mama's footsteps. I thought maybe I could change her, give her some guts."

"Did you?"

He shrugged, snuffing out his cigar butt in the ashtray next to him. "Maybe. Can't tell yet. She's eighteen. Freshman up at Berkeley. She was visiting that day Duff called but left before you two showed up. I won't know if I did any good until she's about your age, or until she gets married. Who people marry tells you a lot about them." He smiled. "Or who they live with."

He sipped at his coffee. "As soon as I moved in, they were after me. 'Scar, why don't you retire?' 'Daddy, you're getting older. This kind of life isn't good for you.' What did *they* know about what was good for me?" His voice became intense. Instead of reciting dead memories, he was touching active feelings. He stared past us out the window. "After five years, I finally gave in. I retired. Worst mistake I ever made. Just after I retired, Simpson Autotec offered me a job. I turned it down. The guy who took it went up with twenty thousand gallons of crude oil. Janet used to remind me of it every time I brought up the subject of work. Look what a *won*derful thing she'd done for me! Saved my life! I looked. Just because that other guy went up doesn't mean I would have, does it?"

"I suppose not."

"When I talked to you and Duff, I *was* retired. I had accepted my lot. Too old, anyway. Not good for much. Keep a little girl company, maybe, but the little girl had grown up. Big girl. Gone to college. What the hell. Feed the pigeons and forget it. Horace must be out of his mind to think of Scar Smith, I thought." He sipped the coffee. "Cold."

"Would you like some more?" asked Dolores.

"No, thanks." He continued his story, looking past us. "When you and Duff left, I went in for lunch. I had no more intention of accepting Horace's offer than going to the Moon. Harold was home from the bank for lunch. Janet asked what you two wanted. Since she was spying on me, I thought I'd needle her a little. I said you offered me a job. 'You said no, of course,' she said. Something about her tone of voice and that 'of course' stuck in my craw. She continued eating, almost oblivious to my presence, talking to Harold about the bank and listening to him expound on the Prime Interest Rate. Eventually, she realized I hadn't answered. She looked at me. 'You did tell them *no?*'

"In her face, that moment, I saw her picture of me. An incompetent old man, a burden on everyone, the sooner dead the better. In the meantime, keep him out of trouble. The world, after all, isn't made for the sick or the old. I kept my temper. 'I told them I'd think about it,' I said.

"She dismissed the idea with a wave of her hand. 'Don't be silly, Daddy,' she said. 'You gave all that up a long time ago.'

" 'Did I?' I asked. Harold chimed in at that point. 'Scarlyn, this is ridiculous,' he said. 'You're not actually thinking of taking that job?'

" 'I told them I'd think about it,' I repeated, and then the son-of-a-bitch laughed. God *damn* it hurt! He laughed!

"I stood up. I felt like laying him out on the floor. Instead, I walked out. I slammed the door behind

me. I think glass broke. I got in the car and drove to the Merryweather Building."

Smith looked at me. "I haven't been back."

VIII

"Old men talk too much," said Smith, searching for another cigar, patting his coat pockets and avoiding our eyes. I decided to change the subject, asking what he planned to do now.

"I rented a place in Newport Beach," he answered. "I guess I'll just live in it."

"I mean about Norton."

His face brightened, glad to turn attention away from his personal life. "Didn't I tell you? They found most of him." He discovered another cigar in his coat pocket and withdrew it, continuing to talk. Norton's liver had been found in Pomona, his kidneys in the Long Beach-Compton area.

"One each," I said.

"Right. But one thing never showed up."

"What?"

Smith sat back in the chair, the cigar between his teeth. "The brain."

"The *what?*"

"Brain." Smith tapped his temple. "In here."

Norton's brain. It was worth something alive, but dead, as Smith had said, it was meat. Why would anyone want it? Frowning, I asked Smith.

"Who knows? Maybe Norton wasn't the only joker in town."

"That's sort of a grim joke. Maybe it just hasn't turned up."

"Maybe."

"But you don't think so."

"Everything else has turned up."

"How about the possibility of a transplant?" suggested Dolores.

"It's never been done," answered Smith.

"There's always a first time."

"I checked around," responded Smith, lighting his cigar. Dolores opened a window. "No one's even close to being able to do it. Besides, if you transplant a dead brain into a live body, what do you have?"

"Two dead men."

"Right. It's something else."

"What?" I asked.

"That, Robert, is what we have to find out." He puffed on the cigar, thinking. "There are two ways to get information," he mused, "direct and indirect. You can snoop around, putting two and two together, or—" He puffed, wanting me to ask, "Or what?" As a boy—if Smith ever was a boy—he probably rode his bike with no hands, showing off. He enjoyed showing off. I resisted as long as I could.

"Or what?"

"Or get it from the horse's mouth."

"Which do you prefer?"

"Little of both. Let's assume Spieler's involved. We can't just walk up to him and say, 'What did

you do with Norton's brain?' then throw him against a wall and frisk him for it, can we?"

"I suppose not."

"But if we had some idea what he wanted with it, we could ask about that. Take the transplant idea. *If* he wanted it for a transplant, we could ask about that. We could, perhaps, suggest that you needed one."

"Me?"

"Hypothetical situation only. But we know the transplant's probably out. So what now?"

"A rite of some kind?" asked Dolores.

I looked at her. What sort of rite did she think would require Norton's brain? Smith took the suggestion seriously.

"No. The only thing Spieler believes in is profit."

"Then *what?*" I asked.

"Did you happen to see Horace's list of current Spieler projects?"

I faintly remembered looking at a list in Mr. Merryweather's office. I nodded.

"Do you remember an item near the end labeled *Giant Molecule Reconstitution, Organic?"*

"Vaguely. Biology's not my field."

"The work's being done by Dr. A. Perkov at the Golden Years Geriatric Center in Glendale. Spieler owns it."

"So?"

"So how would you like to be my grandson tomorrow morning?"

I saw it coming. Smith wanted me to play grandson and go traipsing around some old people's home. I had too much work to do. The thought of a day off, even a morning off, panicked me. I had not even started to decipher where Norton left the Big Gate. Smith noticed my contorted expression.

"Something wrong?"

"No."

"You don't like Glendale?"

"I like Glendale just fine, but—"

"You don't like me?"

"I like you just fine, too, but—"

"Then what is it?"

"I *would* like to get a little work done. They pay me to be an engineer, not some kind of skulking cloak-and-dagger man."

"You're getting in a rut. You need a break."

"Rut! I've only worked *one* day! I *can't* do it, Smith."

He looked at Dolores. "He's a very responsible young man, isn't he?"

"Very."

"Don't *you* get in on this," I told Dolores.

"Like the man said, Robert," said Smith, "when Smith says spit, you spit."

On the way to Glendale the next morning, gripping my seatbelts every time Smith took a corner, I asked what I was supposed to do, other than the things he had briefed me on the night before. The briefing had covered very little.

"Just act natural, buddy boy."

"That's a big help."

"I had Pamela make an appointment for me at nine."

"Who's Pamela?"

"Horace's receptionist."

I remembered the blond at the Merryweather Building. "Oh."

"Not bad."

"What?"

"Pam."

"You're too old for that."

"Have you ever heard of Charlie Chaplin?"

We arrived at the Golden Years Geriatric Center, a collection of bland two-story buildings in front of a cemetery, before nine. Smith, dressed in a suit ten years out of date and a necktie, got out, stooped. I gestured at the cemetery.

"Convenient."

"Yep." His voice cracked, dry and old. His face, normally taut, had gone slack. He peered slowly around at the cemetery, getting into his part. "But I'm still here, buddy boy." He laughed a cackling sort of laugh. "Wherever here is."

For an instant, I believed him. "Glendale."

His voice momentarily became normal. "You sounded good. Keep doing that. Just react to me. Don't think about it."

I helped Smith along the walkway to the main building. We passed several old people in wheel chairs, who watched us, comparing their infirmity to Smith's. They seemed consoled by the comparison.

Inside, the receptionist, a matronly woman in a white dress, told us to take a seat. Smith glowered at her.

"I don't *want* to sit down!" he cackled, swatting at my supporting hands.

"Gran'pa, please, sit down."

"I don't *want* to!"

I shrugged. "So stand."

I walked over to a chair and sat down, picking up a magazine viewer. Even though I knew Smith was acting, I still felt embarrassed at the scene. Smith did nothing to alleviate the feeling. He pointed a trembling index finger at me, cackling. "I got-cha, Freddy! I got-cha!" He continued cackling and pointing. It struck me as overdone.

The receptionist came around the desk and took Smith's outstretched arm. He looked at her, his expression quizzical, then amazed.

"Louise?"

"No, Mr. Smith. I'm not Louise. Why don't we sit over here and wait for Dr. Perkov?"

"Who?"

"Dr. Perkov."

She led him to the chair next to mine and seated him.

"Who's Perky?" asked Smith, then cackled, delighted.

"Dr. Perkov will be free in a few minutes," she told me.

I thanked her and turned on the magazine. I became engrossed in an article on Martian blight. When

I looked up, Smith was gone.

"Gran'pa?"

The receptionist, glancing up from some papers, looked around the waiting area. Her eyes stopped on the hallway. She dropped the papers and dashed down the hall. I followed.

Smith, his voice echoing hollowly in the corridor, had some other old man up against the wall, throttling him. The man's eyes were terror-stricken. Smith kept shouting, "Give it here, Jeb!" "Jeb," or whoever he was, made raspy noises.

The receptionist and I freed "Jeb," who scurried off down the corridor at full shuffle.

"Mr. Smith," cautioned the receptionist, "we mustn't attack people, must we?"

"Who?" He saw me. "Jimmy! What are you doing here?"

"Robert," I corrected.

We led him back to the reception area. Seated, I leaned over to him, whispering.

"You're putting it on a bit thick."

He cackled and pointed at me.

Fortunately, Dr. Perkov appeared before Smith could think of any more antics. Perkov, a long-faced man with a Van Dyke, shook hands with us. Smith kept calling him Father Perky, evolving it into Father Pesky and Father Porky. Perkov ignored him, discussing commitment with me. I followed the instructions Smith had given me the night before.

"It *is* better," I said, after Dr. Perkov explained the excellent facilities at the center, "to keep them at home, if possible."

"Yes, yes. We encourage it. Family environment is always helpful, but in *his* case—"

"He's not usually violent, Doctor," I said, deciding to repay Smith for jeering at me. "The incident with the little girl was, well, an oversight on our part."

"Little girl?"

Smith, momentarily out of Dr. Perkov's view, raised one eyebrow.

"It's not worth mentioning. We do have a place for him. Our problem is his memory. He recognizes none of us. I mentioned the problem to a friend of mine and he said Golden Years might be able to help."

"We do have certain treatments to retard the effects of"—he glanced at Smith, then lowered his voice—"s-e-n-i-l-i-t-y."

"I heard you two!" roared Smith. *"I didn't do it! Go ahead! Beat me again! I never touched that sweet little girl!"*

"Beat him," said Dr. Perkov, giving me a sidelong glance.

"Frankly, Dr. Perkov, my grandfather is quite a serious case. Perhaps if we had brought him sooner—"

"What are you getting at, Mr. Collins?"

"He needs something stronger than simply retarding what is, after all, a *fait accompli*."

"I see." Dr. Perkov eyed Smith, scratching his beard, considering. "Perhaps—"

"Perhaps what?"

"There *is* a treatment. I developed it."

"What sort of treatment?"

He shook his head, vigorously negating his "perhaps." "No, I can't do it."

"Doctor, we're desperate. You can see what shape he's in."

"The name's *Smith*," shouted Smith. "*Doc*tor Smith to you birds."

"A doctor?" said Doctor Perkov. "He was a doctor before . . . this?"

"Yes."

Perkov pondered, debating with himself. Finally, he looked at me. "Mr. Collins, I have a problem. On the one hand, my work is highly experimental. The main office forbids me using it in therapy for commercial reasons. They want to insure its complete safety and also our exclusive use of it. On the other hand, a man like Dr. Smith, a colleague who has helped so many, should enjoy the twilight years. Perhaps, if you told no one—" He let the sentence dangle, waiting for my response.

"I won't tell a soul."

"Follow me."

Dr. Perkov led us down the corridor to a room marked "Private." The old man Smith had attacked passed us in the hall, veering away from Smith. Smith shook his fist in the air, shouting, "I'll get you, Jeb!"

"Such a shame," muttered Dr. Perkov, unlocking the door.

We followed him into his laboratory. Long tables displayed chemist's glassware, test tubes, glass coils, beakers. We stopped at a temperature-controlled locker. Dr. Perkov punched in the combination. The locker door slid open. He removed a vial, holding it aloft. He looked at it, transfixed, marveling at his own discovery.

"That's it?" I asked.

"Yes."

"What is it?"

"A catalyst, more or less."

"For what?"

"Ultimately, for increasing engram definition in the brain, Mr. Collins."

"What does it do?"

I shouldn't have asked. Dr. Perkov started on a lecture that would have boggled Watson and Crick. His catalyst, he informed me, affected each building block in the subject's cortical DNA molecules, deoxyribose sugar, the phosphate unit and especially the nucleotides.

"Them, too."

"Indeed."

The purines, adenine and guanine, as well as the pyrimidines, cytosine and thymine—all were affected. I nodded, trying to keep my eyes from glazing over. I had pushed Dr. Perkov's button. He didn't come equipped with an off-switch.

The quantity of adenine, I learned, was increased above the other nucleotides, hence more adenosine triphosphate and hence higher energy conversion in the phosphate group.

"You do see that, don't you?"

"Hm-m-m."

"Most people don't."

"Hm-m-m."

He rummaged in a drawer and pulled out a wooden box, opening it and removing a microscope slide. He slipped the slide into a microscope, stooped and adjusted it.

"Look at this."

I looked. The slide, stained purple, showed several irregular black blobs with spidery tendrils spreading from them at random.

"What is it?"

It was a Golgi stain of a section of occipital cortex showing dendrites of large cortical cells, he explained, annoyed at the question.

I asked why I was looking at it. Another mistake. Dr. Perkov broke out in analogies. Nerve cells like these were the printed circuits of the brain, the well-trodden paths through the jungle of the mind, if not the very foundation of civilization itself.

Vitamem, Dr. Perkov's discovery, revitalized the DNA in those circuits, enhancing the engrams like a photographer enhances faint photographic negatives. More particularly—I winced at the phrase; I had thought he *was* being particular—the spines of the basal dendrites in the synaptic contacts between nerve cells in the cortex were stimulated.

"Stimulated," I repeated.

"Yes, let me show you."

He dug in the drawer again, coming up with two pictures that reminded me of abstract photography. He seemed to have them upside down.

"These electron micrographs," he said, "will clear things up."

"I doubt it."

"The one on your left"—he jiggled the photograph in his right hand—"shows cortical dendrite spines of the senile brain. You see the shriveled effect."

"Not exactly."

"This one on your right"—he jiggled it— "is *after* Vitamem. You see the alert, vigorous posture of the spines."

"Puts backbone in them."

"Exactly."

"A doctor once said my grandfather has dead tissue in his brain. The stroke, I believe. Will Vitamem help that?" I began to feel like a commercial.

"You do realize, Mr. Collins," he said, replacing the photographs in the drawer, "that death, whether on the small scale of a cell or the large scale of an entire organism, is a relatively permanent condition. Is there some particular reason—" The clause hung in air, a question.

"The money," I improvised. "He's forgotten where it is."

"I see. Very sad. What were you

planning to do with . . . the money?"

"Pay for his treatments."

"Ah, yes. But you must understand, extracting engrams from brain tissue is a delicate process. The tissue must be fresh."

"How fresh?"

"Not more than two weeks old. Your grandfather's stroke must have been some time ago."

"It was."

"Too bad. I just had an interesting case recently, however."

I could see I was in for another fascinating barrage of biology and tried to look interested. "Really?"

"Yes. The man worked for our drone ship division. He died accidentally. They say he kept everything in his head. You can imagine how upset they were to lose him. They brought the brain to me—fresh, mind you, or nearly so—and asked my help. It was a challenge, Mr. Collins, a challenge." He pointed across the laboratory to one corner. "That's it, over there."

I looked across the tables. Only a computer display occupied the corner. "The brain?"

"No, no. The information in it—the engrams—safely stored in our company computer."

"You succeeded."

"Partially, yes. *They* didn't seem too happy about it, however. The tissue had been damaged in removal, you see. Not my fault at all. The man who removed it seemed to know more about karate than surgery. It was a rather small organ, runty actually. But the cortical cells themselves—" He whistled.

"Big?"

"Gig*an*tic!"

"But they weren't happy with your results?" I coaxed.

"No. A rather grizzly little man kept saying, 'What about the tachyon?' Except it wasn't just tachyon. The man cursed. It was the *damn* tachyon, as I remember. 'We *know* about phase-shift! What about the *damn* tachyon?' He must have repeated it ten times. It was absolute nonsense as far as I was concerned. I told Mr. Spieler I did not want that man around here in the future."

Dr. Perkov's upper lip quivered, remembering the grizzly little man. He sighed deeply and looked at me. "*But*, this has very little to do with your grandfather. When would you like to submit him to treatment?"

Smith, who had listened to the discussion, suddenly became active, knocking over beakers and coiled glass tubes, shouting about how the revenuers were coming and we had to get rid of the still.

"Next week," I answered. "I'd better take him home now. It's time for his nap." I led Smith toward the door.

"Good. Make an appointment at the desk. I'm sure we can help Dr. Smith."

"He needs it."

IX

"What do you think?" I asked Smith in the car.

"I think they drained old Norton like a swamp. Did you understand any of that?"

"Not much." I told Smith about tachyons, faster-than-light particles, identified at the end of the Twentieth Century. I was into a simple comparison between mesons, neutrinos and tachyons when Smith interrupted. People always interrupt during the interesting parts.

"OK, I believe you. You're starting to sound as incomprehensible as Father Perky back there."

Smith drove me to the Corona del Mar Gate. I thought about Norton and tachyons and the grizzly little man who deposited Norton's brain with Dr. Perkov.

"It doesn't make sense, Smith."

"What doesn't?"

"Norton didn't have anything to do with tachyons, at least that I know of. Mesons, yes. That's part of Gate physics, and neutrinos, not tachyons."

"Keep gnawing on it. You'll come up with something."

He dropped me outside the Gate blockhouse. Wheels spinning and rubber squealing, he disappeared down the access road, shrinking to a red dot. Still puzzled, I suited up and walked aboard the *Merryweather Enterprize.* Captain Wilkins passed me in a corridor, glancing at his watch and frowning, but saying nothing.

In my office, I called Burgess and asked for a copy of Norton's integration computer program.

"*All* of it?" He asked, incredulous.

"Yes. And a mathematician."

"You'll need one."

The mathematician, a cadaverous-looking man named Webber, came into the office smelling of garlic. He looked about nineteen. No worries, staring at numbers all day—it kept him innocent. He seemed anxious about being in my office.

"Is there some problem, Dr. Webber?" I asked.

"Hm-m-m? No, no."

"You don't look well."

He stood there a moment, looking at everything but me. He reminded me of a child about to be scolded. Finally, he stopped fidgeting and looked at me, mustering shaky indignation.

"I haven't *done* anything," he protested.

"Who said you had?"

His indignation disappeared, replaced by blank incomprehension. "I thought—being called here—I, naturally—"

"You thought what?"

"I heard about Captain Wilkins, and—" He broke off, his face asking for sympathy and understanding. It took me several seconds to realize what Webber's "and" meant. He had heard about my fray with Captain Wilkins, that I was somehow the reincarnation of

Norton. He assumed I wanted to chew him out. My reputation as an ogre was spreading. As a patrol leader in the Boy Scouts, they laughed at my orders. Here, nobody laughed. It was a strange feeling.

"You understand, Dr. Webber. I need some help deciphering Norton's program."

We worked through most of the afternoon. I spent half my time saying, "Oh, yes. You're right. I see it now." By four o'clock, Webber's talents awed me. He could compress a whole section of the program into a single simple equation or expand a minor phrase into a ream of paper. He seemed to do it at will, grasping the answer and only retracing his steps to explain how he got there to his dumb-dumb boss. When he finished, I had what I wanted. Webber, still timid, retracted the lead into his mechanical pencil and stood up, rubbing his eyes. I noticed his suit. Threadbare.

"Will that be all, sir?"

"Yes. Thank you, Jim. You can go home if you like."

"Home?" He pronounced the word as though it were new to him.

"You do have one?"

"Yes, sir. But Dr. Norton—I mean, there's still an hour and a half to work and he never let us—"

I shrugged. "What can you get done in an hour and a half?"

He started to tell me. With a mind like Webber's, an hour and a half was a long time.

"Take the time off. You deserve it."

"I do?"

He left, bewildered. I checked with personnel. Webber made fifteen thousand a year.

"You're kidding," I said to the girl on the screen.

"No, sir."

"Double it."

"But, Mr. Duff will—"

"If you have any problems, refer Mr. Duff to me."

My good deed done, I called Smith. No one answered. Either Smith had forgotten to redirect his phone calls or he was away from a phone. I called Mr. Merryweather.

"Ah, Robert. How are things up there?"

"Fine. Have you heard from Smith?"

"He called at noon. He said the two of you had been trying to get him committed."

"The way he drives, he should be committed. Do you know where he is now?"

"I'm not his secretary, you know." He chuckled at the idea. "Is it important?"

"Yes. I think I've figured out what happened to Norton and why."

Mr. Merryweather knew about Dr. Perkov and Norton. He listened patiently while I recounted my version of the events, the body removal, the brain removal, the

memory removal. When I mentioned tachyons, he stopped me.

"Just a minute, please."

I waited. The screen flickered and settled.

"Go on."

"What was that?"

"Scrambler."

I told him about Norton's program, splicing in as much physics as I could. His attention never wavered. He never asked for an explanation. Norton's program called for anything fed through the matter transmitter to be accelerated to near-light-speed. According to Einstein, that meant near-infinite-mass. To do it, Norton needed the controlled-laser fusion reactor I was supposed to build. So far, so good.

At near-light-speed, the trip to the nearest star still takes a little over four and a quarter years. Spieler's drone ships took over eight years to deliver their first load. Now, ships appeared monthly and probably would continue appearing for the next fifteen years. The Merryweather Big Gate, designed to reach across the light-years and rip out a hunk of planet fifteen kilometers in diameter, would cut the trip in half. It would cut the expense by a factor of ten. Once the ore arrived, it could be mined in orbit, undercutting Spieler's price and destroying his capital investment in drone ships.

Norton had taken the proposition one step further. Once something in the transmitter accelerated, he drained it of energy, converting the entire mass into tachyon particles. Tachyons, existing only at super-light-speeds, lose mass as their speed increases. At the end of the journey (or the beginning, depending on your viewpoint; both the beginning and the end are actually the same event, observed from a different space-time position) the process is reversed. Energy is added to the tachyon particles, slowing them to light-speed and near-infinite-mass, then integration into sub-light-matter slows them to below-light-speed. Eventually, at something like rest, they pop out of the Gate's field.

"I hope you realize the implications, sir."

He smiled, tolerant. "Norton and I discussed them several times. It is my prime reason for continuing. I think the capital outlay is justified by the possibility of almost instantaneous travel to the stars, don't you?"

Hearing the idea vocalized for the first time, and believing it, stunned me. Each pinpoint of light I had seen from the control room of the *Merryweather Enterprize* would be as near as Corona Del Mar.

"There's only one problem, Mr. Collins."

"What's that?"

"According to what Smith said, Spieler got wind of it *before* Norton's death. I intentionally had Norton omit any reference to it in

his reports. You don't have any lead on that, do you?"

I remembered Parry saying he and Norton had eaten lunch at the *Vier Jahreszeiten* often.

"One."

"Good. Look into it. I have a meeting with our Soviet affiliate in Kharkov this evening." He paused. "Or will it be morning there? Keep at it, Mr. Collins. If Smith calls here, I'll have the call referred to you."

He hung up.

Look into it. Keep at it. How was I supposed to look into or keep at anything? I only knew three things about Parry. He worked, indirectly, for Spieler. He was either an industrial spy or a diligent salesman. He liked German food. Why would Norton, aware of the need for secrecy, talk to him about the super-light-phase of the Big Gate project? He wouldn't. I scratched my head. Would he?

The phone hummed.

"Collins," I said.

It was Pamela at the Merryweather Building. "There's a Mr. Tuttle here. He insists on talking to someone in authority."

"Tuttle?"

"He says it's about Scarlyn—I mean, Mr. Smith."

Tuttle . . . H. Winton Tuttle . . . Harold. "Tell him I'm gone. Give him to Mr. Duff."

"Mr. Duff *is* gone."

I considered passing Harold on to Mr. Merryweather, then changed my mind. Mr. Merryweather had enough problems.

"Put him on."

Harold came on the screen, his face florid and hair windblown. "Listen, Collins, I warned you!"

"You did?"

"I forbade you to employ my father-in-law. I want you down here *this* instant to talk about it!"

"You do."

"I will wait"—he gestured at something off camera—"by the elevator!" He hung up.

He would have a long wait. I began collecting the things I wanted to take home: document viewer, containing the critical portions of Norton's program; my notes from the afternoon with Webber; a small—the phone hummed.

"So!" accused Harold, furious. "You're not here!"

"Right."

"If you think you can avoid me with this . . . this . . . *ruse,* you are sadly mistaken!"

"How *can* I avoid you?"

"You can't!"

"I'm a little tired of this, Mr. Tuttle. Can you get to the point?"

"The *point* is my *father*-in-law! He came by our house this afternoon to get some of his things!"

"I don't see—"

"No! You wouldn't! He was *bleeding,* Collins, *bleeding!"*

Suddenly, Harold had my attention. "Seriously?"

"I'm quite serious."

"I mean, was he bleeding seriously?"

"It was only a small cut over his eye, but he *limped!* He tried to conceal it, but I saw it! He definitely limped!"

"What happened?"

"He wouldn't say. He was—how shall I put it—difficult to handle. I was afraid, frankly, that he might get *physical.*"

"He didn't?"

"No."

"Too bad. Where did he go?"

"That's what *I* want to know. You have to talk some sense into him. Do you know what he took with him?"

"No."

"A gun! I didn't even know there was one in the house! I *forbid* his getting involved in this!"

"It doesn't sound as if you have too much to say in the matter, Mr. Tuttle."

"Perhaps this will convince you. I followed him outside. I tried to reason with him. The man is impossible. I told him to look at himself. A seventy-five-year-old man, running around like some fool in his twenties. *Really,* Mr. Collins! I admit he *seems* to be in good shape, but *no* one seventy-five is in good shape"—he tapped his chest—"inside. I don't care *what* the doctors say. I told him that. I told him he should come back and let us take care of him. It just made him angrier! He's crazy, Collins! Demented, senile, and *crazy!* I told him just that! I told him he should act his age, be like the other old gentlemen in the neighborhood, enjoy his sunset years!"

"What did he say?"

"He laughed and called me a pipsqueak."

I laughed.

"This is not a joke, Collins."

"Did he say anything else? Where he was going?"

"No. He just checked that horrible revolver, got in his car and left. He almost ran over me pulling out! *That's* when I saw the rear window of the car. There was a *bullethole* in it! A bullethole, Collins! I intend, at the first opportunity, to take legal action. Commitment, if necessary!"

"You missed your chance."

I hung up.

When the phone hummed again, I let it hum. I collected my things and started for the station Gate. As I passed the control room, Captain Wilkins called my name. I went in.

The night crew, two men, monitored the equipment. Captain Wilkins looked worried.

"What is it, Captain?"

He pointed at a radar screen. "Look at this."

I looked. The random pattern of blips was meaningless.

"That," he said, pointing at a blip near the center of the screen, "is the transmitter focusing ring. The smaller blips are constructors and our equipment."

"What are those other two blips?"

"Spacecraft."

"Government?"

"Private."

"Whose are they?"

"It's impossible to say. They're unmarked. They've taken up orbits matching ours. We tried hailing, but got no answer."

"Are they drone ships?"

"No. Too small and drones automatically set off beacons after their second shift. These ships don't have beacons."

"What do you think they want?"

"Who knows?"

"Thank you, Captain. Inform me immediately of any change."

I suited up and returned to the surface. On the way home, standing in the packed mono rail car, I reviewed Norton's program, holding the strap with one hand and the document viewer with the other. Jenson, starting with nothing, had created the matter transmitter. Norton, starting with Jenson's Gate, had opened the stars to man.

The implications staggered my imagination. Norton could have opened either a treasure chest or a Pandora's box. I remembered staying awake nights in college, debating the moral issues of technology with my roommate, a social science major. He would pose some hypothetical discovery—dynamite, atomic fusion, genetic manipulation, Jenson Displacement, anything—pointing out its potential for evil. Each could be used to kill and enslave.

He expected me to take the opposite side. Each could also save lives and liberate. I never did. Whatever man discovers or invents can be perverted. Split table salt, and you get sodium and chlorine, poisons. The question is how technology is used, not what it is. How to use a discovery is a political question for those in power, not us worker ants.

Yet, Norton's addition to technology was potentially devastating to human society. Did the scale of its possible impact become a moral question in itself? If the English longbows at the Battle of Agincourt enabled them to pierce French armor, so what? True, it was a technological advantage. But a small corner of medieval Europe, where a battle was won or lost because of technology, remained a small corner of medieval Europe. Norton's technology could enslave a galaxy. Was it still a question of *how* the Gate was used? Or was the Gate itself now at the center of the moral storm?

Getting off the monorail, walking down the escalator to the street, it hit me. I had to know the answer to my question. If the Big Gate's very existence was the issue, I was the only person with the power to enforce the moral decision. I could, if I had to, destroy Norton's work. I shivered, turning the corner onto our block. Smith's red Ferrari stood in front of my house.

"So what happened to you?"

Smith sat back in my easy-chair, crossing one long leg over the other. A small cut, closed with Plastaid, showed over his left eyebrow. He touched it. "You mean this?"

"*And* the limp, *and* the gun, *and* the bullethole in your car window."

"The limp's gone." He patted his ribs. "The gun isn't, and the bullethole—" He shrugged. "They couldn't run fast enough to catch me on foot."

He liked being evasive, heightening the suspense. Smith as hero. He enjoyed telling it as much as doing it. I wondered whether Smith, nowhere near his second childhood, had ever left his first.

"Who couldn't catch you?"

"The leader looked short."

"And grizzly?"

"You could say that. I dropped you off and I got to thinking. A dangerous practice, I know, but I got to doing it anyway. Whatever Spieler wanted—"

"*That* I can tell you."

"He didn't get. He had two choices. Forget it or try something else. A man who would steal Norton, crack his skull like a walnut and literally pick his brain, wouldn't forget about it. What, I asked myself, next?"

Smith had driven out to the Spieler Space Operations Center in Tustin, eleven acres of prime real estate. Drone ships, built in space, were prepared and tracked from the Center. Incoming ships transferred their cargoes to lunar shuttles. From the Moon, ore was fed to the purchaser through a Jenson Gate. Repair crews, dispatched from the center, refurbished the drone fleet. If, as Dr. Perkov indicated, Spieler knew Norton's phase-shift solution, the Space Operations Gate could now transfer men or ore through a series of relay satellites, thus eliminating transshipment via the Moon.

Smith applied for a job, Gatekeeper. He knew enough from talking to the Merryweather Gatekeepers to convince a personnel man of his abilities. During a tour of the facilities, he noticed a squad of armed men assembled outside the Gate blockhouse. Security, explained the tour guide, a Gatekeeper himself. Approaching the group, Smith made his mistake. He asked how the tachyon aspect was progressing.

"I must be getting stupid," said Smith. "Senile. I'd heard the word from you and Father Porky. I wouldn't know one if it bit me. But it seemed to be the crux of the matter."

"It is."

Smith thought if he dropped the word—tachyon—casually enough, he might get a lead. He dropped it.

"The guy looked at me like I had just handed him Norton's liver."

Pardon me? said the Gatekeeper.

Tachyon? repeated Smith.

The Gatekeeper started yelling his head off. Grizzly—according to Smith, the meanest midget he had ever seen, though I doubt the man was that short—ran over to them.

What's up? asked Grizzly.

The Gatekeeper pointed at Smith like he was Jack the Ripper and yelled, He knows!

Knows what? asked Grizzly, looking up at Smith.

About the tack-tack-tachyon! sputtered the Gatekeeper.

"The man stuttered something awful. Too much pressure on him. Too many secrets," mused Smith. "Secrets. Don't talk. Can't talk—something to it."

"What did you say?"

"I looked at Grizzly and tried to play dumb. 'Me?' I said, 'Tachy-what?' It was too late to play dumb. Grizzly started to pull out his sidearm." Smith sighed, shaking his head. "I don't know, buddy boy. I must be slowing up. Ten years ago I would have seen it coming and decked them both."

Smith knocked Grizzly's gun to the ground. Grizzly came around with a right, clipping Smith's forehead.

Smith elbowed him in the solar plexus.

"He went down like a bag of cement."

The Gatekeeper had the gun. The side of Smith's shoe caught the Gatekeeper's wrist, possibly breaking it. The Gatekeeper yelled. The gun flew. Smith ran. Keystone Cops. Except the bad guys were the cops.

Smith was lost. He cut through an office building at full tilt. Women screamed. He bumped into one with her arms full. Papers flew, settling like a flock of seagulls. He tripped on a wastebasket and jammed his leg against a sharp desk corner.

"Hurt like hell."

As Smith picked himself up, Grizzly and his men exploded into the room. When the secretaries saw the guns, they started running around screaming as if the fox was in the hen house. Grizzly, prudent, decided against shooting through them.

Out the opposite door went the fox. Smith loped down the corridor, his leg hurting. He was still lost. He stopped at the Information Desk.

Which way out?

The girl pointed. He ran. His foot hit the proximity detector field for the double doors just as Grizzly and company rounded the corner behind him. The doors opened long enough for Smith and a bullet to get out. He never heard the explosion. Just the zip of the bullet going past. He made it to the car, hit the starter and prayed.

The turbine caught. He jammed the accelerator to the floor. The Ferrari shot across the parking area toward a dirt field. He wanted to get to the dirt before they started shooting again. Someone got off a

round. Smith heard a *thunk*. He thought at first it was a rock. The seat next to him bobbed forward and a two-inch hole bloomed in the headrest. When he glanced in the rear-view mirror, he saw the other hole. Dime size. He bounced into the field.

A dust cloud rose behind him, obscuring his view. He veered toward the street, hoping the dust camouflaged him. He hit the street doing fifty and let out the Ferrari. No one followed.

"Smith."

"Hm-m-m?"

"Duff thinks you're a menace."

X

"What now?" I asked.

Smith withdrew a file card from his coat pocket and looked around for a document viewer. I handed him mine. He inserted the card and handed it back.

"That's Spieler. We talk to him."

The face—sharp-edged, tough, intelligent—looked younger than thirty-nine. I indexed the viewer. The second picture showed Spieler in a sweatsuit, running.

"Another runner," I said.

"The man has his good points."

At six every morning, rain or shine, Spieler ran five miles, his chauffeur trailing in the limousine. A detective's report, stamped "Merryweather Security," appeared after the pictures. Spieler arrived at his office every morning at eight sharp. He worked until past seven each evening. Other than running, he had no hobbies. Sometimes he stayed at the building for days, leaving only for his morning run.

Once a week, Saturday evening, he relaxed. From seven to ten PM, he went to a club he owned, The Hollywood Star, in Hollywood. He never drank or smoked. He listened to the music and left at ten, usually alone, occasionally with a girl. It was never the same girl.

Smith walked across the room and sat down next to me, noticing where I was in the report.

SPIELER, FREDERICK, MARCUS

BORN: 23 Jan 1983, Bangor, Maine.

PARENTS: Martha and Wilber (Moved Calif. 3-2-85).

SIBLINGS: Four brothers, two sisters (See Appendix "A").

Smith pointed to the sibling entry. "Spieler was in the middle. Do you have any brothers or sisters?"

"I'm an only child."

"Older brothers are louder and stronger. Younger brothers are cuter and more lovable. There's something to it."

"What?"

"Little Freddy had to compete for Martha and Wilber."

I continued reading.

EDUCATION: Long Beach Polytechnic High School; Track, football; GPA, 3.80; Grad. June, 1999.

UCLA: Track, football; Maj., Bus. Ad; Minor, psychology, philosophy; GPA, 3.95; Grad. Summer, 2002.

Stanford, School of Business Administration: MBA, Grad. June, 2003 (Note: two-year program, completed one year).

"Why do you suppose," interrupted Smith, "he minored in psychology and philosophy?"

"He liked them?" I suggested.

"He wanted something from them. Psychology might tell him how his mind worked. He wanted to know that. Who am I? It didn't tell him. Psychology can't. If you know how a computer words, you don't necessarily know what's in it. He switched to philosophy, superseding form for content. But philosophy—" Smith turned up his hands. "Who ever got anything from philosophy?"

"I always liked it."

"Sure. So did I. I rather like Hume myself. Very witty. He can prove you aren't reading the book you are reading to get his proof. Fun, but hardly something to hang your hat on for life, especially if you're a man like Spieler. Philosophy's like art. Personal. Everyone has to develop his own."

I laughed. "That's a philosophical position itself, Smith, and a debatable one."

"True, but it fits in Spieler's case. Did you see the paper he did for a philosophy seminar?"

I indexed the viewer to the fourth appendix. "Machiavelli, Nietzsche and Mao Tse-tung: Psycho-philosophical Applications to Intercorporate Politics." I whistled.

"Freddy got an A-plus on that one," said Smith.

"Have you read it?"

"Yep. Bright boy."

I returned to the factual resumé and read the last item on the list.

Founded Spieler Interstellar, Aug. 2003.

Initial Capitalization, $20,000.

Current value, $150,000,000,000.

"A heavyweight," I said.

"I'd say he knows what he wants now," said Smith. "Even if he's still having trouble with who he is." Smith frowned, dissatisfied with his conclusion. "Or better yet, what he thinks he wants." He looked at me. "Like to meet him?"

"Spieler?"

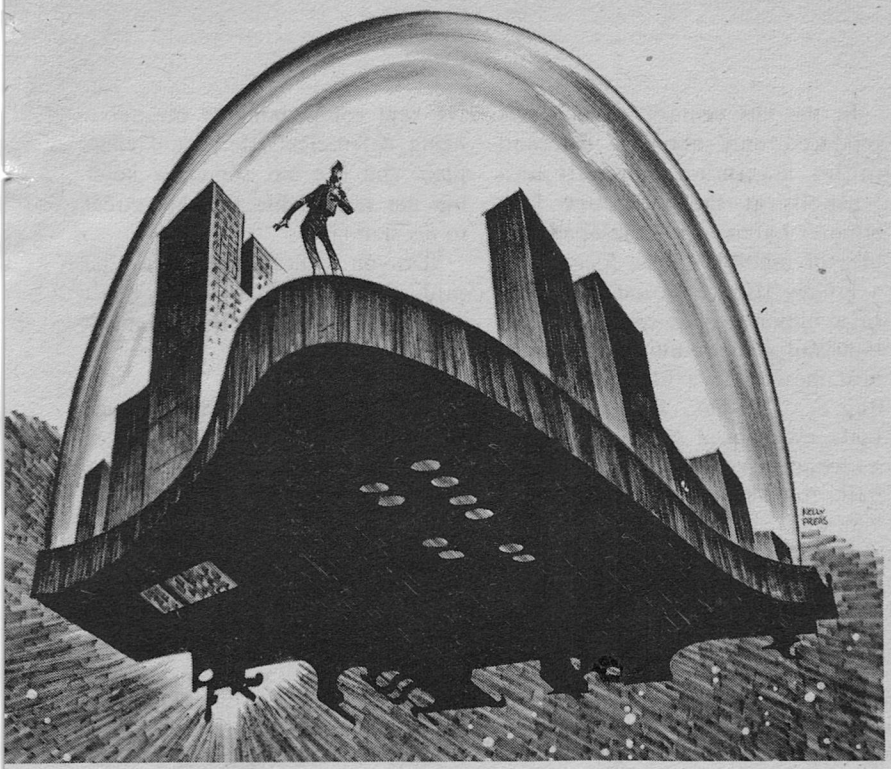
"The horse's mouth himself. Saturday night. And bring Dolores. I'll pick you up about six-thirty." He looked around the room. "Where *is* Gladstone, anyway?"

"At school probably."

At school. It suddenly dawned on me. Neither Dolores nor I had let Smith in.

"How did you get in here, Smith?"

He blushed, looking guilty, and



smiled. A friendly smile, for a burglar.

The rest of the week, I concentrated on my own work, building the Big Gate. Most of the construction started by Norton ran under its own momentum. By Thursday afternoon, I was actually playing with a drafting screen. Not working, just toying, trying to set up what I would need for a controlled-laser reactor.

The two and a half years since I finished my dissertation could have been a decade. It worked to my advantage. Most of the engineering problems I envisioned, and a few I missed, someone had already solved. One or two solutions even reflected suggestions in my dissertation. Those things are actually read sometimes.

The lasers themselves gave me the most trouble. Most laser applications use a constant beam of pulsed light. For that reason, a laser-induced fusion reaction was once thought impossible. For a lone beam to heat a pellet of solid heavy hydrogen and implode it at thermonuclear temperatures, it has to produce more than a billion joules. Otherwise the laser consumes more energy than the reaction produces. Billion-joule lasers *are* theoretically possible.

In the last century, when lasers produced only about a thousand joules maximum, Emmett and Nuckolls at the Lawrence Livermore Laboratory developed the idea of multiple lasers, focused on a hollow ball of frozen hydrogen. In a billionth of a second, a ten-thousand joule multiple laser can heat the ball to a hundred million degrees Celsius. The hydrogen boils, escaping at a thousand miles a second. Escaping, it implodes the ball. Action-reaction. Remember Newton?

The ball's density is now a hundred times that of lead. The nuclei fuse, releasing nuclear energy like a collapsing star. Liquid lithium around the implosion chamber transfers the energy to the heat exchanger and from there to the generators.

A hundred implosions a second in a hundred chambers can produce ten billion watts, enough for the Big Gate and my toaster, too.

After I got the specs on both the General Electric and Westinghouse multilasers, I remembered Parry. I called Fenton Laser Products.

Parry was out. I left word for him to call me. Before I went home, I checked with Captain Wilkins. The two spacecraft still hung in an orbit matching ours. Neither showed any sign of life. Our work-crews came and went, finishing the Big Gate focusing ring, unmolested. The longer the ships did nothing, the more Captain Wilkins worried. He kept complaining to me about being defenseless. He would complain and eye me, somehow holding me responsible for this threat to *his* station.

"Do you realize, Dr. Collins," he said, eyeing me, "that we don't even have a handgun aboard, much less anything useful?"

What did he expect me to do? Order up a nuclear cannon? Space stations are the most vulnerable of man's creations. Even if we had a cannon, the recoil would probably knock us out of orbit.

"Sorry."

He grunted.

Parry returned my call that evening.

"Ah, Dr. Collins," said Parry after Dolores called me to the screen. I could see the corner of a stag-hunting picture behind his head. "I'm sorry I missed you on the station. Rather convenient, being able to return home each evening."

"Yes."

"I remember when I first met Dr. Norton. He made it back infrequently. How can I help you?"

I told him I needed information on Fenton's multilasers. He listened, absorbing my technical questions without taking notes, nodding occasionally.

"I see. We do have several units that would fit your requirements." He listed them, reeling off specifications faster than I could jot down the figures. A good salesman knows

his product. So does a good industrial spy. "But may I make a suggestion?"

"Sure."

"Try our FLP-Four."

"Four? You just said the Four was superseded."

"In most applications, yes. Frankly—and I would not wish this information spread around—" He paused, waiting for my assurance of confidentiality.

"Mum's the word."

"Our later models, Five through Nine, will soon be obsolete. One of our technicians, using the basic design features of the FLP-Four, has developed a million-joule unit. It requires little more power than the Four, which produced only ten thousand joules."

"Sounds good."

"It *is* good. As a matter of fact, the man who developed it did so by accident."

"Serendipity?"

"No. More an accident. It killed him. He died shortly after his work was complete. His heirs are becoming difficult. They threaten legal action. They claim the man developed these modifications after leaving our employ, that the modified device is theirs. The claim is utterly groundless, but—" He pursed his lips, his expression asking sympathy.

"Annoying," I suggested.

"Exactly. We would rather throw the device on the open market, unpatented, than submit to this extortion. Your request comes at an advantageous moment. If you purchase FLP-Fours, which cost considerably less than Nines, I can supply you with modification information that will produce more power, cheaper. Merryweather Enterprises will save money—always a happy prospect—and you will be credited with the innovations responsible for the savings."

"Why me?"

"The man's heirs. I assure you, all work was done in *our* laboratories on *our* time. These heirs are scoundrels. The man himself was once caught stealing from the company. Who knows how often he escaped detection? Should a thief's heirs benefit by his skullduggery, Dr. Collins?"

"I suppose not."

"Of course not." Parry sounded genuinely indignant. "Your use of the modifications will appear independent of ours. Great minds, after all, do run in similar channels. An idea whose time has come, comes, despite thieves or their heirs. This will show them that anyone can make this laser without us and that the potential profits are not, as they currently believe, astronomical."

"I feel as if I'd be stealing the fruits of another man's work."

"Nonsense. The man was a scoundrel. His heirs are scoundrels. Probably his whole bloodline is tainted. He is dead. One cannot steal from the dead."

Somewhere, there was a hole in

Parry's argument. "How soon can you get the information to me?"

"Tomorrow morning."

"Fine." I said good-bye and hung up.

"Dolores," I called into her closet. I heard some papers shuffle.

"Yes, dear."

"Can you steal from a dead man?"

"No, dear." Maybe Parry *was* right.

"Just from his heirs."

"Oh."

I called Smith. His new number, unlisted to avoid Harold, showed a Newport Beach prefix.

He came on the screen with the phone in tight focus. A pillow showed on either side of his head. Apparently the phone rested on his stomach.

"Sorry I woke you."

"You didn't. What's up?"

"I just talked to Parry." I repeated the conversation, including Parry's improbable reason for giving me credit for the FLP-Four innovations. As I finished, the picture on Smith's end bounced, as if someone had jostled the bed.

"Are you alone?"

"More or less."

"Who's there?"

"A friend. Here's what I want you to do," said Smith, continuing before I could say anything about his friend. "Check Parry's information. If it's good, use it. He'll want something in exchange, probably something he already knows, like that phase-shift business. Give it to him. He knows anyway. Be reluctant, but give it to him. Then he'll have you."

"He will?"

"The next time, he'll ask for something big."

"The tachyon conversion."

"Yes."

"I'll give that to him, too."

"No. You'll balk."

"Good. I wondered whose side you were on."

"You'll balk, then you'll give it to him. Let him threaten first. He'll say if you don't come across, he'll tell Merryweather you're not a boy genius."

"Mr. Merryweather probably knows that."

"He'll have proof. Phase-shift was a secret. He can prove he knows the solution. Cooperate or else, he'll say."

"I'll cooperate."

"Yes. Give him rigged figures. While he's checking them out, we might have enough time to stop them altogether."

Give him rigged figures. Smith threw off the phrase as if all I had to do was change a number here or a number there. Rigging figures on an engineering project is harder than developing the real figures. They have to look good to a trained eye but be wrong.

"Smith, do you have any idea how hard it is to rig figures?"

"No."

"It's hard. You don't just tear

out the multiplication tables, change a few numbers and hand them to Parry. They have to be convincing."

"You're young and eager. You'll think of something."

"Not that eager."

"Just do it and quit your bitching."

"You seem pretty sure about all this."

"I've dealt with people like Parry all my life. Keeping one step ahead of them is my job." He paused. The camera shook again. Someone said something off-camera. Smith nodded, then returned his attention to me. "Or it was my job, before I retired. See you Saturday, Roberto. I've got to go feed the pigeons."

He hung up.

"The next morning, Parry's specifications waited on my desk. I called Hilda at the Merryweather computer center. Grumbling, she set up a computer model of Parry's FLP-Four and laid in the modifications. According to the computer, Fenton's laser would produce considerably more power than Parry indicated. A reactor, using Fenton's lasers, would easily produce three times the power of our original design, or more. I was impressed. The power curve ran off the scale. When I noticed it, Hilda frowned, thinking I would want a rerun of the entire program. Her frown—like a Pekingese about to be kicked—stopped me. I was satisfied. The reactor would power the Gate. If Fenton's equipment lived up to the figures by half, I would have no complaints. I thanked Hilda. She looked relieved.

I ordered Fenton's lasers and put Bernie Mitchel in charge of modification. As soon as word got to him, he called me.

"Bob," said Bernie, frowning, shaking a piece of paper at me on the screen, "what the hell is this?"

"I put you in charge of laser modification."

He laughed. "So I see. Got a minute?"

"Sure. What for?"

"I want to tell you everything I know about lasers. First, it's light. Second, my dentist has one. Third, he knows more about it than I do. Fourth—"

"You're a bright boy," I said, remembering his comment when I hesitated over taking the Merryweather job. "You'll learn."

"Bob."

"Engineering's engineering," I reminded him.

"All right, maybe I deserved that, but seriously—"

"Seriously, I want this job done right. That's why I want you to do it."

He looked over the reassignment sheet in his hand. "It says here modifications."

"You'll get all the details."

"Where'd you get the modifications?"

I hesitated. The idea of lying to Bernie, my engineering mentor,

bothered me. First, I had never lied to him. Second, he knew my capabilities better than anyone. If I claimed to have developed the modifications myself, he would take one look and know I was lying. "The muses spoke."

"Muses?"

"Just do it, Bernie. It's important."

Friday evening, Rodriguez reported completion of the focusing ring ahead of schedule. I told the girl in accounting to give the construction crew bonuses.

Saturday, I read over the week's work reports. Burgess was expecting the Master Toole integration computer any day. The integration, modulation and acceleration equipment would be ready to plug in by the middle of April. All it needed, his report pointedly reminded me, was a socket. I dictated an over-all status report to Mr. Merryweather and went home.

Smith arrived at six-thirty, dressed to kill. He had on a polka-dot tri-tie, one of those three-bladed bowties—two blades horizontal, and one hanging vertical—that pass for fashionable. It did make me feel self-conscious about my cravat. He grinned, exhibiting himself in general and his tie in particular.

"Like it?"

"Beamy," said Dolores, poking at her hair in front of the hall mirror.

"She never says I'm beamy," I complained.

Smith looked me over. From his expression, I expected him to say, "You aren't."

"You'll do."

"You look just fine, Bobby," said Dolores.

"Thanks again."

"You *do*."

Smith glanced at his watch. "Let's go. We have to pick up my date."

"Date?" said Dolores and I simultaneously.

Smith's description of his date, delivered while weaving through traffic to her apartment, grew in extravagance the longer he talked. We were, under no circumstances, to make fun of her hunched back. Dolores protested, asking what kind of people Smith thought we were.

"You're OK," answered Smith. He nodded toward me in the back seat. "It's *him* I'm worried about. Any man who chews up space station commanders and spits them out would make fun of a wooden leg."

"Wooden leg!"

Prosthesis, actually, Smith explained. His date received a horrible injury during the National Karate Championships. Unfortunately, one of her best tattoos went with the leg.

By the time we pulled up in front of a tall apartment building in Surfside, our picture of Smith's date was awesome. A hunchbacked little old lady with a wooden leg and tattoos, practicing karate.

"Back in a minute," said Smith, popping the car door. "I have to get peg-leg."

Dolores got out and moved to the cramped back seat, plopping down next to me.

"Dolores."

"Hm-m-m?"

"I think Smith is pulling our wooden legs."

"Nothing gets past you, does it, Bobby?"

Peg-leg, otherwise known as Pamela Rysor, the receptionist at the Merryweather Building, looked stunning. Her black skirt, ankle-length, was slit to mid-thigh. She showed more sternum than an anatomy class skeleton. A single strand of pearls circled her throat. I was transfixed watching her get in the car.

"Hi, Mr. Collins."

The way she said it, more breath than voice, made Dolores pinch me.

I introduced Dolores. Smith got in.

We picked up the San Diego Freeway northbound. Smith punched the exit we wanted into the Guide computer and got in the Guide lane. It surprised me. The way Smith normally drove, I expected him to stay in manual all the way. The bullethole in the rear window whistled above fifty.

"Smith."

"Hm-m-m?" answered Smith, chatting quietly with Pamela in the front seat.

"What are we going to do tonight?"

"Have fun, buddy boy."

"Dancing, singing—that sort of thing?"

"Sure."

"What about Spieler?"

"Is he a baritone or tenor?"

"Seriously."

"I'm serious. He can join us if he wants to."

"What if he doesn't?"

"What would you do in his position? He undoubtedly knows your face and, by now, mine. We show up at his club, singing, dancing, whatever. Would you be curious?"

"Sure, but—"

"But what?"

"There's a difference," I told him, "between *looking* in the horse's mouth and *being* in it."

The Guide signaled Hollywood Boulevard. Smith returned his attention to the road and switched to manual. Behind us, a white van pulled out of the Guide lane. I had noticed it near Pamela's. We stopped at a signal and turned onto Hollywood Boulevard. The van followed.

"Smith."

"Yep."

"Someone's following us."

"The white van, you mean.

"Yes. Who is it?"

"Search me."

We neared the address of Spieler's Club. Smith started to park. The van started to park. Smith pulled out and circled the block.

The van followed. Smith parked again. The van, unable to find a parking space behind us, passed. A man in the passenger seat glared at us. Neither Smith nor I recognized him. They parked a half-block in front of us, remaining inside.

"They're waiting to see if we stay put," said Smith.

"Are we?"

"Sure. I came to dance, not play hide-and-go-seek."

XI

A violaphone honked, backed by bass, piano and saxophone—all throbbing, squealing and electrified. We pushed our way through the bobbing bodies toward a table. The walls, floor and ceiling looked like giant projections of tinted amoebas, dividing and multiplying. So did most of the people. A girl, her face reduced to a blinking trance—but frenzied, definitely frenzied—grabbed my hand.

"Dance?"

"Hm-m-m?" I inspected the corners of her mouth for foam.

"Dance," she droned, undulating.

"I have to—"

"Dance," she commanded, oscillating.

"But—"

"No dance?"

"No."

Her tongue lolled from the corner of her mouth. I took it to be a sign of disapproval. I followed Smith to our table. Almost immediately, he and Pamela disappeared into the crowd. I could see Smith's arms flailing over the dancers and catch glimpses of Pamela, writhing. She writhed well.

"What's he doing?" I asked Dolores.

"Pardon me?"

I shouted above the squealing violaphone. *"What's Smith doing?"*

"He said he was going to look things over!"

"The only thing he's looking over," I yelled, *"is Pamela!"*

"I saw you getting an eyeful, too!"

"Dolores! Please! Don't start that!"

The band reached something near ten to the tenth decibels.

"Dance?" Dolores might have said. It was impossible to tell.

"WHAT?"

"DANCE?" Dolores shimmied, signaling her meaning. Abruptly, the band stopped.

"NO!"

Smith and Pamela approached. "What are you yelling for, buddy boy?"

"Smith," I said, my voice still louder than normal in spite of the pause in the music, "we can't stay here."

"Why?"

"We'll all go deaf."

"You don't know what's good, buddy boy. That's the Stone Jock up there on the bandstand."

"I don't care if it's Rudy Vallee or someone else out of your heyday. They pierce."

"Rudy Vallee was a little before my time," said Smith, nodding across the dance floor. "There's Spieler."

I looked across the room. At a table next to the dance floor, Spieler sat with two men and a girl. She looked familiar. After several seconds, I recognized her as my erstwhile dance partner.

"Does he know we're here?" I asked.

"Who knows?" Smith answered. The band struck up. "Let's dance, Dolores."

Smith led Dolores onto the floor. His arms flapped above her bobbing head. Though Smith's style could have been improved, his enthusiasm seemed boundless. Pamela looked at me, inquiring, over the din, whether I wanted to take a turn around the floor.

"We might as well get group rates at the chiropractor," I shouted.

"Pardon me?"

"Never mind!"

Once I got into the music, only my spine felt about to snap. Everything else held up. The amoebas flashed on the walls, the ceiling, the people. Pamela—purple, green, orange—wobbled in front of me, her anatomy threatening to free itself with each twitch. Faces flashed past—Smith, grinning; Dolores, intense, puckering; Pamela, erotic; Spieler, inquiring.

I tried to talk to Pamela.

"Miss Rysor!"

"Pam!"

"Where did you meet Smith?"

"At work!"

"Did he take you anyplace interesting Wednesday?" The gossip in me wanted to know.

She looked at me, squirming rhythmically. *"Wednesday?"*

"Didn't you go out with him"—someone jostled me—*"Wednesday night?"*

"Not me!" She bent forward, shaking her blond hair like someone emptying a dustmop. The music stopped. I stopped. Eventually, Pamela stopped. We headed back to our table. The leader of the Stone Jock—perhaps the Stone Jock himself—announced a fifteen-minute break.

Smith began to regale Pamela and Dolores with a tale from his youth. I could see Spieler out of the corner of my eye, talking to one of his men. I imagined a contract being put out on us, hit men behind every door. I remembered the white van outside.

"Smith."

"Don't interrupt," said Dolores. Dolores thinks she has to improve the creditable job my mother did on my manners.

"Smith."

He continued his story, ignoring me Pamela and Dolores, round-eyed and breathless, listened.

"Smith."

"Bobby, please!"

"Smith, Spieler's coming this way."

Smith, annoyed at my interruption, scowled at me. "So?"

"I just thought you'd like to know."

"He had to, sooner or later, didn't he?" Smith returned to his tale. Spieler approached and halted near Smith's elbow. He looked different than the pictures in the Merryweather file. Not older, just harder, more intense.

"And then," said Smith, glancing up at Spieler as if he were a waiter, suddenly discovered at the table, "the man said—" Smith's voice trailed off. "Hi, Fred."

Spieler, his lean face impassive, scrutinized Smith. Sizing him up? Probably.

"I understand," said Spieler, "you've been applying for work at one of my companies."

I heard a faint New England intonation in Spieler's voice, inherited from his parents.

"Man's gotta eat," said Smith.

"I could have you thrown out, Mr. Smith."

"You could," said Smith, smiling. "But you won't."

"I won't."

"No."

"Why?"

"I'm the piece in the game that doesn't fit."

Spieler looked startled. Somehow, Smith had touched a nerve.

"What game is that, Mr. Smith?"

Smith waved his hand at Spieler, pushing aside the question. "Come on, Fred. Don't play dumb. You're a direct man. Be direct." Before Spieler could answer, Smith turned to Pamela. "Do you like football players?"

"Sure."

I could see she did. Too bad for us old ping-pong men.

Smith nodded at Spieler. "Fred here was a quarterback at UCLA. In eighty games, he only took to the air thirteen percent of the time. Ground games. Slug it out. That's Fred. Sixty-three percent of his ground plays went through the middle. There's something to that."

Spieler listened, smiling faintly. "That was a long time ago, Mr. Smith. People change."

"Not much. You saw us here. You came over. You could have sent someone else." Smith glanced at Pamela. "Fred's a direct man." He looked up at Spieler. "As long as you're here, have a seat."

Smith continued his asides to Pamela. "You see what I mean? Direct. Right to the point." He looked at Spieler. "I want to talk."

"So talk."

"Why do you need armed men at your Space Operations Center?"

I flinched. Smith was no end-run man himself. By Spieler's expression, calm yet courteously attentive, Smith could have been asking where he got his cravat.

"We've had a rash of old men running through the facilities. We don't want them to get hurt."

"How bad is Merryweather going

to hurt *you* when the Big Gate's finished?"

"Not much. We have established markets."

"Come off it, Fred," said Smith, lighting a cigar. He puffed, working up a substantial ember and blowing out smoke. "He's going to break your back and you know it."

"There are doubts," said Spieler, glancing at me, "that the Gate will be finished. *If* anyone were capable of finishing it, and *if* it were finished, and *if* it worked, we estimate some encroachment on our markets."

"Encroachment!" hooted Smith. "You won't have any markets to encroach *on*." He puffed the cigar. "Next question. Why do you have two spacecraft standing off the Big Gate?"

"Mr. Smith, as you no doubt know, I try to keep my Saturday evenings free of business concerns."

The more I watched Spieler, the more impenetrable he seemed. He listened to Smith, showing little reaction. Once or twice, his cheek, tinted green by the club lighting, twitched. It could have been the smoke from Smith's cigar, irritating his eye. In another context—meeting Spieler at a party or at work—I would have described him as quiet. Knowing his background and remembering Norton, his silence seemed threatening, unpredictable.

Smith bearded the lion.

"Try this on for size, Fred. The major capital investment of Spieler Interstellar is in drone ships. Your first shipload made you a billionaire. Since then, you've sunk everything into the fleet. The odds were with you. In spite of the cost, the financial risk was low. If only ten percent of your fleet returned, you would profit. Then Merryweather started the Big Gate. Word got out. Spieler Interstellar stock slipped. It's down eighty-seven points now and still going."

"Eighty-six."

"The rats are leaving the sinking ship. You had to stay competitive or hit the showers. You would never hit the showers. You have to play, don't you? But how? Any day Merryweather will pull a hunk of rock out of that orbiting mother lode and tie it to your feet.

"Merryweather put up relay satellites to his space station. Your technical people told you it could mean only one thing. The interface phase-shift problem for ungrounded matter transmitters had been solved. If the solution applied to your drone ships, it meant you could send people.

"Drone ships go out empty. Everyone knows an empty leg on any type ship is wasted space. Why not send out people? Passengers pay more per pound than rocks. You got the phase-shift solution somehow—"

"Smith," I interrupted.

"Quiet, buddy boy."

"Smith, you're talking too—"

Spieler looked at me, his expres-

sion cutting off my protest. "Let him talk."

Let him talk, hell! Smith was about to blow the whole thing. Why? A rational explanation eluded me. I remembered Smith's after-dinner conversation on Monday evening, describing his relationship to his daughter and son-in-law. It boiled down to one thing. Smith wanted to be considered a competent adult, someone capable of dealing with the world no matter what the world tossed at him. His family refused to give him that respect. He thought he had figured out Spieler's motives. He wanted Spieler to know it, to appreciate it. Smith pictured Spieler as his personal enemy. If his enemies respected him, he knew it was given only because it was due. His enemies had respected him once. They would again.

I stood up. "Let's get out of here, Smith."

Smith jabbed an index finger at me. "Sit down, buddy boy!"

"Smith, you can't do this. You'll blow—"

"I can do *any* damn thing I please! Ask Horace." The intensity of his feeling showed in his face. "Now, *sit down!*"

I sat down. Smith looked up at Spieler.

"You got the phase-shift solution, but you learned something in the process. Merryweather had a flying wedge play tucked away. When did you realize it was all over? Three months ago when Norton wouldn't play on your team? Hell of a guy, that Norton. He didn't give a *damn* about money, did he? How much did you offer him? Half of everything, wasn't it?"

Spieler's eye twitched. He remained silent.

"Half! And he laughed at you. He was a mean son-of-a-bitch, that Norton. He didn't care about money. He didn't care about his wife—and *she* was no help to you. She can't do long division without a computer. She could repeat what Norton said but she didn't understand enough of it to make any sense. Norton only wanted one thing in his life and he already had it. He wanted his Gate finished, his precious theory verified. You knew Norton. The Gate would work. A man like that couldn't fail. Did you have him killed or did someone just oblige you, knowing it would please you?"

"Smith," I said. His tirade was turning sour. Accusing Spieler of sharp business practice was one thing. Accusing him of murder could get us killed.

"Just a minute, buddy boy. I've got one more question."

Behind Spieler, the band mounted the stage, preparing to blare.

"You'd better make it quick," I said, watching the saxophonist limber up.

"My question, Freddy, is what

now? No one's irreplaceable and Norton's been replaced."

Spieler stood motionless, glaring at Smith. Slowly, a smile broke on his face, a smile I can only describe as a snarl, muted but twisted. I felt I was staring directly into Spieler's mind. When he spoke, quietly, his voice had a force of will and determination I have never heard from anyone else.

"I'll win, Smith."

The band blared, drowning any response from Smith. Spieler turned and pushed his way violently into the dance floor crowd.

Smith motioned for us to leave. We followed him. I knew Smith had blown it, revealed everything we knew about Spieler. I made up my mind to talk to Mr. Merryweather. Smith *was* old. His judgment had become distorted. He wanted to prove he was still hero, the eternal damn hero.

Outside, I tried to talk to Smith. He smiled pleasantly at me. Nothing had happened, said the smile. Old Smith, the hero, was on the job.

"Now we're cooking," he said.

"Now we're cooked, you mean. How in hell's name do you expect to deal with that man when he knows everything we know?"

"You worry about Norton's Gate and I'll worry about Spieler."

I caught Smith's sleeve and stopped him. Dolores and Pamela paused, looking at me.

"You'll worry about Spieler," I mocked. "This is not some kind of game, you know! You and Spieler fighting it out for King of the Mountain! If you're right that he's involved in Norton's death, he may become involved in *ours!* Did you see that man's face when he left the table? He wanted to break your neck with his own hands!"

"Yep. Did you see those eyes?"

"Yes, I saw them! That's what I'm talking about!"

"And that mouth—twisted like that."

"Smith, you *love* this, *don't* you?"

"He's nuts, you know."

"Who?"

"Spieler."

"You're the one who's nuts!"

Dolores broke in. "I did feel kind of sorry for Mr. Spieler the way Scarlyn was browbeating him."

"Sorry for him!" I yelled. "Wait until a bomb flies through our front window and see how sorry you feel!"

"Bobby, don't get hysterical."

"I'm *not* getting hyst*e*rical! Smith here just gave away the whole game!"

"I'm sure Mr. Smith knows what he's doing."

"You people are *all* blind!"

Smith put his hand on my shoulder. "Robert, why don't you worry about something important."

"Like *what?*"

"The Gate, or—"

"Or what?"

He pointed down the street. "The two guys in that white van."

XII

The van followed us home. On the freeway, Smith pulled out from the Guide lane and stepped on the Ferrari. The van dwindled behind us. He slowed, letting it catch up.

"What was that for?"

"Now they know I'm *letting* them follow me."

"This is just a big game to you, isn't it, Smith?"

"Bobby, don't be obnoxious," said Dolores.

"Sure, it's a game."

"Do you care who wins?"

"I'm paid to care. Look at it this way. If someone said, here's a high stakes poker game. I want you to play. I'll take the winnings but I'll suffer the losses. I just want you to play. Would you play?"

"It depends."

"For someone like Horace."

I thought about Mr. Merryweather. "Probably. But this isn't a poker game. And how do you know those two are following *you?* They could be following *me.*"

"Oh, Bobby," said Dolores. "You're so egotistical. Why would anyone follow you?"

"I *did* replace Norton, you know."

"Robert's right," said Smith.

"I'd rather be wrong."

At times, the world is against you. I could see it was my time. People like Smith, blabbing their heads off to people like Spieler. People like Dolores, accusing me of egomania. *Me!* I sulked the rest of the way home. All I wanted was a phone. Mr. Merryweather had to know about Smith.

Smith pulled up in front of our house. The van parked down the street.

"I'll drop you two here," said Smith. "As soon as you get inside, check the street from the window. If our friends are still there, call a cop. If not, I'll handle it."

"OK, hero."

Smith looked at me. "What was that crack for?"

"Forget it. Let's go, Dolores."

Pamela got out and pushed the seat forward. Dolores and I followed.

"Good night, Pam."

"Good night, Bob."

Dolores and I walked up the path to our front door. Dolores was muttering something. I asked what her problem was.

" 'Good night, Pam,' " she said while I looked for my key. " 'Good night, Bob.' "

"Dolores. Please."

"Good night, ootsy-cootsy little Bobby."

"You don't like her?"

"I like *her* just fine. It's *you* I'm worried about."

Inside, I checked at the window. The van was gone. I went to the phone and called the Merryweather Building. They put me through to Mr. Merryweather, who was out of the building.

He came on the screen wearing a

Mao jacket. I must have looked startled.

"When in Rome," said Mr. Merryweather. "What can I do for you?"

"It's Smith."

I told him about Smith and Spieler. He listened, possibly smiling. It was difficult to tell. Inscrutable. When I finished, he thought a moment.

"Robert."

"Yes, sir."

"Ten years ago, I got a call very much like this one. From Phillip. Smith was a menace. Smith was insane. Smith was this and that."

"I don't see what Duff has—"

"I admit Phillip had other reasons. Smith was apparently zeroing in on him. But the tenor of the conversation was the same. I also admit Smith's actions sound peculiar."

"Peculiar is hardly the—"

"But Scarlyn has one other quality, in spite of his methods."

"What's that?"

"He's usually right. Give him your complete cooperation."

"But, sir—"

"As Captain Wilkins was recently told," continued Mr. Merryweather in an even voice, "if Scarlyn says spit to windward, spit."

I blushed. "I understand."

"Good. I have to go now. Chairman Chee is waiting."

The screen went blank.

Cooperate. OK, the private had his orders. He might think the general was nuts, but he had his orders. He went to bed, grumbling. Privates always grumble.

For three weeks, I saw nothing of Smith, or much else. I became so immersed in the Gate's problems, I hardly saw Dolores, even when she was sitting on my lap.

"Bobby?"

"Hm-m-m?"

"What are you thinking about?"

"Work."

A constant refrain. Work. I never *felt* dazed. I just looked it, walking around with engineering on the brain.

"Bobby?"

"Hm-m-m?"

"Can't you stop thinking about that *stuff?*"

"No."

"Your gray matter's going to transmit."

"Hm-m-m?"

One day during the week after our visit to Spieler's night club, my office phone hummed. Pamela informed me H. Winton Tuttle was on the line.

"Tell him to go to hell."

"I'm afraid he won't go."

"All right. Put him on."

Harold, unable to find Smith, had found Collins, again.

"I *told* you, Collins!" shouted Harold as soon as he saw me.

"More than once, no doubt."

"He's *escaped!*"

"King Kong?"

"*No!* Scarlyn! I told those men

he was dangerous. But no—they didn't believe me."

"You told who?"

"This has gone *far* enough! Do you understand me?"

"What men?"

"From the Golden Years Geriatric Center."

Golden Years? Dr. Perkov? Spieler?

"What kind of car did they have?"

"I really don't know! I warned you, Collins—"

"A white van?"

"Yes. I think it was white. Why?"

"Mr. Tuttle, please calm down. What connection do you have with Golden Years?"

The day after Smith and I visited Dr. Perkov, two men appeared at Tuttle's house in Seal Beach. Smith, they said, had begun procedures to voluntarily commit himself to the Center. At the last moment, Smith became violent, attacking another patient. According to them, Smith fled. They followed, but he escaped. No mention was made of me.

Tuttle remembered the cut over Smith's eye and his limp, attributing them to the attack on the patient.

"Didn't you wonder about the bullethole in the rear window?" I asked. "If they were trying to stop him for his own good, they wouldn't shoot him."

"They said they knew nothing about the hole. For all I know, Scarlyn could have been out robbing gas stations."

They showed Tuttle commitment papers, assuring him their treatments would soon alleviate Smith's violent propensities. After all, they argued, Smith himself had sought commitment and treatment in a lucid moment. Smith was a danger to himself and others. All Tuttle had to do was get his wife's signature on the commitment order. A daughter could commit a father.

"And you did it."

"Of course. Scarlyn is sick."

"But he escaped."

"Yes. He injured one of their people, I understand."

"Seriously, I hope."

"It just *proves,* beyond a shadow of a doubt, that Scarlyn *is* dangerous!"

"If they call back, tell them your wife has changed her mind."

"I'll do no such thing! I warned *you!* I warned *him!* Scarlyn is slipping fast. I want him safe before he injures himself seriously! I can see from your expression, Collins, that you intend to do nothing! You have been warned!"

He hung up. I tried to call Smith. No one answered. I tried again that night and the next day. For the next two and a half weeks, he was missing in action. I concentrated on my work. Smith, after all, could do any damn thing he pleased, or so he said.

The integration computer arrived

from Master Toole in San Francisco. Even with minichip construction, it filled four of Burgess' assembly rooms. Half the computer was backup circuits. Since computers worked at sub-light speeds—electrons being what they are—and tachyons work at super-light-speeds, most of Norton's program had to do with anticipation flip-flops. A batter at home plate, who hits the ball into center field, finds it difficult to run out and catch the ball. The fielder, even looking into the sun, can anticipate where the ball will be and catch it. The computer played batter and fielder. It still had to think fast, even if it could ancitipate. Its flip-flops had been glitch-tested to five nanoseconds without a crash.

Burgess had the computer ready by mid-April along with the modulation equipment. The pressure on me doubled. Everything was ready but the reactor. I began spending nights and weekends on the station. I put on a double shift. My disposition deteriorated. I snapped at everyone, even Dolores.

"Bobby," she said one night, waking to find me sitting up in bed with a notebook and pencil.

"What?"

"What are you doing at this hour?"

"Reworking these specs for Bernie. I couldn't sleep."

She looked at the pencil and paper. "Don't you need your books or something?"

I tapped my temple with the eraser end of my pencil. "It's in here."

Saying it, I remembered Norton. For the first time, I felt something for Norton. Understanding. I understood Norton's passion to prove his theory. I understood how it consumed his every thought. He sacrificed friendships, marriage, an offer of unimaginable wealth—eventually his life—proving it and himself.

"Dolores."

"Hm-m-m?"

"Have you noticed any changes in me during the last month?"

"You're very concerned about your work."

"Anything else?"

"No, dear. What were you thinking about?"

"Norton."

"You're not anything like Norton."

"I'm not?"

"No."

"You're sure."

"Sure, I'm sure. He was sort of a fanatic, wasn't he?"

The next day, I chewed out Bernie Mitchel. Where the hell were my lasers? And the liquid lithium, he could at least have that sent up.

"Bob."

"What?" I snapped.

"What's bothering you?"

"Nothing. Let's just get this damn show on the road!"

"You need a vacation."

"I need some cooperation. Where's the lithium?"

"Duff's holding up the order until we absolutely need it."

"Duff!"

I broke the connection and called Duff. He never got a word in edgewise. I got the lithium. When I told Dolores about it, she said Duff should have told me to go to hell.

"I suppose that's what *you* would have done," I said, annoyed.

"Yes," she answered, calm in the face of my somewhat loud statement. "When you reward obnoxious conduct, people are just more obnoxious the next time."

"You have a degree in psychology, too?"

"No. But it's true."

"Let's not bring up my manners."

"This isn't manners. It's just common decency."

I grunted.

All right. So I was a son-of-a-bitch for a while. I got my reactor.

Smith called the day we ran through the last systems checks.

"How's it going, buddy boy?" He looked relaxed and tanned.

"Busy. Where have you been?"

"Fishing."

I remembered Smith's last fishing expedition, using himself for bait at Spieler Space Operations. It almost got him hooked. "Catch anything?"

"A few trout. You look haggard, Robert. Have you lost weight?"

"Some. Tell me about your trout."

Smith began describing trout—rainbow, steelhead, three, five, seven pounds. I scrutinized his tan face. It was hard to say if he was joking.

"Smith."

"What?"

"You really *did* go fishing."

"Would I lie to you?"

"I thought—" I shook my head. "You weren't speaking metaphorically?"

"Nope."

The idea overwhelmed me. Smith spent a week rattling Spieler's cage—invading facilities, confronting Spieler himself, spilling everything we knew—then dropped everything. To go fishing! I tried to control myself.

"What about Spieler?"

"What about him?"

"You just let him hang fire."

"What else was I supposed to do?"

"*Some*thing! *Any*thing! Damn it, Smith—"

"Robert—"

"That man's out there . . ." I pointed off camera. Actually, I was pointing into space. Spieler could hardly have been out there. "He's trying to get us! And *you, you're* off fishing!"

"Robert—"

"Gone fishing! I'll put it on our tombstone! Gone fishing! And right next to it, Out to Lunch!"

I hung up.

Smith called back immediately.

"Robert."

"What is it?"

"I thought I'd come up and visit your junkbox. Have those ships near the focusing ring moved?"

"No."

"I didn't think so. See you." He hung up.

Burgess, Captain Wilkins, even Webber, the mathematician, along with assorted technicians, engineers and the company astronomer, Dr. Steichen, crowded the control room. Smith, his dark brown face contrasting with the pallid complexions of the station crew, stood at the rear of the crowd, searching for a match. Unable to find one, he gave up, chewing the cigar instead.

I pushed to the front of the crowd. Dr. Steichen came over to me with a document viewer, squinting first at it, then at me. Steichen squints constantly. A star in a telescope is probably too bright for him. He was in charge of coordinates.

"Dr. Collins, I've laid in the coordinates for Wolf 359c. The star itself is eight light-years distance. Several of Spieler Interstellar's first ships have appeared from there recently. They prove it a potentially profitable location. If I understand correctly, the Gate should take considerably less than sixteen years."

"Considerably. Thank you, Doctor."

The more I thought about it, the

more I thought Smith was probably right. Spieler resorted to stripping Norton's memory in desperation. With Norton heading the project, Merryweather Enterprises could be sure of success. With me in charge, Spieler could afford to wait. If I bungled the job, Spieler could watch Merryweather Enterprises sink, the albatross of a focusing ring around its neck. The idea did nothing to lessen my sense of responsibility.

"What are we waiting for, Dr. Collins," asked Burgess at my elbow.

"Rodriguez," I answered. "He's repositioning the cameras. We want to have a clear view of what we get."

"If we get anything," said Burgess.

"You're a big help."

"I just meant—"

"Never mind. Where's Smith?"

"Back there, I think."

"Would you get him for me?"

Burgess left. Several monitor screens around the room lit, showing the Gate field. Through the shimmering field, the stars, normally motionless points of light in space, twinkled.

"Station Gatekeeper reports Rodriguez back," said Captain Wilkins.

"Fine."

Smith pushed through the crowd to me.

"Hi, buddy boy." 'He inspected my face, chewing his cigar. "Nervous?"

"Don't ask. If I knew, I might get that way. Sorry I blew up."

"Forget it."

"See that?" I asked, pointing through the transparent wall at the focusing ring.

Smith nodded.

"Now you're going to see some real fishing."

I stepped to the Big Gate control panel. The controls, three touchplates below direct readouts that summarized the activity initiated by each switch, were protected by safety covers. The first cover was up, its touchplate lit, "Power." The load readout above it showed no appreciable burden. I flipped up the second safety cover, "Focus," and touched the plate. Amber glowed beneath my finger. The power drain increased slightly. The Gate reached out. Momentarily, I imagined the reactor blowing, a blast of billowing light sweeping away station and Gate. It would ruin my reputation.

"Where's Mr. Merryweather?" I asked Captain Wilkins.

"He's watching from his office."

To Mr. Merryweather, in spite of his understanding attitude, the Gate was a business venture, a risk. To me? I didn't know. I flipped up the last safety cover, "Activate."

"Got a rabbit's foot, Smith?"

"I'm not superstitious."

I touched the plate. The dull red plastic lit under my finger.

TO BE CONCLUDED

EXCLUSIVE EITHER/OR

Good things come in small packages—but so do bad things!

ROWLAND E. BURNS

"You Mr. Levine?" the youth at the door asked.

"I'm Dr. Levine . . . Dr. Saul Levine."

The visitor glanced down at a small package he held. "I guess this is for you, then. You expecting some slides from photolab?"

"Yes! Yes, of course I am. Give them to me. The press conference is barely twenty minutes away."

"So take them, Mr. Levine," the boy said as he shoved the package toward the older man. He slammed the door a bit too hard on the way out.

Levine hardly noticed. The scientific community was held in little respect by most young people and he had become accustomed to the fact. Besides, the boy had long hair which marked him as more conservative than most. It was the skinheads that caused almost all of the trouble.

The researcher snapped on a small high-intensity desk lamp and began candling the slides. Most of the details checked with his memory on each of the twelve, and the only error that he found was a missing arrow on number eleven. Levine thanked the artists aloud, thanks that would never be heard since the room was empty except for himself. There would have been no time for corrections since only seven minutes remained before the press conference.

Levine reboxed the slides, took off his lab coat, and slipped into a sports jacket which he had carefully chosen for the occasion. A glance in the mirror told him that he could be reasonably satisfied with his appearance, satisfied except for his totally bald head. At times he had been mistaken for an elder skinhead.

The official publication of his work . . . the lab's work . . . was due to appear in *Nature* the following day. There would be hell to pay with the editors for this premature press conference, but with the magnitude of the discovery and his reputation there was precious little that they could do about it.

Levine detoured to give his slides to the projectionist and then stepped onto the stage at 10:03, a time that he considered optimal. He decided that the audience looked bad. Aside from his staff

and coworkers there seemed to be few mature reporters; the bulk of the audience was composed of skinheads. Apparently most of the media had underestimated the importance of the announcement and had assigned junior reporters.

Before starting his speech, the scientist carefully cleared his throat out of range of the microphone. It was impossible to tell if there were any women in the audience what with the shaved heads and unisex clothing. He decided to drop the traditional speech opening of "Ladies and gentlemen . . ."

"Thank you for coming" Levine began. "Today I shall announce a discovery of major importance that will have a profound influence on the future of the human race." The audience sat unmoved.

"Since this discovery is in the field of genetic engineering, it would be well for us to review a few of the discoveries of the last few years as background material.

"Basic understanding has progressed very rapidly in the last decade, though practical fallout has lagged. Perhaps one of the most spectacular achievements has been the elimination of mongolism and leukemia, as a pair, for all infants whose mothers have undergone treatment."

"That was one of yours, wasn't it, Doc?" a skinhead with a feminine voice shouted.

"I led the research activity, but it was a product of the University laboratories" he answered. "But to proceed with the matter at hand, our assignment this time was of quite a different nature. The University was contracted to determine whether or not it is possible to breed only human beings which are incapable of harming other human beings!"

That hit the audience, especially the skinheads. Absolute pacifism was one of their tenets, as it had been with their predecessors, the Hippies. The shock was heightened by the fact that the research had been done in absolute secrecy.

"You mean there ain't gonna be no more wars, ever?" one shouted.

"Hear me out," Levine replied while wondering how someone with such a total lack of grammar could possibly claim to be a reporter.

"Don't give us that crap, Doc. Did you make it or didn't you?" It was the girl again.

"Young lady, my associates and I have spent the last seven years of our lives on this project. If my rate of presentation doesn't suit you, please leave. I can stand the loss." The audience quieted, apparently waiting for him to continue.

"Bob, if i can have the first slide," he whispered into the auxiliary microphone.

An idealized view of human genetic material appeared on the screen. Levine used the first few slides to explain the "association centers" concept which had first

been proposed by Greyhan in 1978, specifically calling attention to the red box which accounted for the pair of diseases that he had mentioned earlier.

"I am sure that most of you are aware of the widely held theory that human beings are, genetically, a collection of viruses. All our characteristics stem from the addition of one or more virus to the genetic pool. When Slater first proposed this theory it was met with almost universal ridicule; since that time it has been almost absolutely established that every mutation is the result of a viral addition.

"One of the direct results of Slater's . . . uh . . . theory is that any genetic manipulation will result in at least two modifications of the test subject. Of course 2, 4, 16, et cetera, modifications are also possible. Very often the second modification is quite undesirable.

"Thus, our problem was at least twofold. The first problem was to determine the center which is associated with hostility and the second task was to determine the other change—or changes—which would occur in humans if hostility were to be removed."

"If you can stop war, what else counts?" came the shout.

"Hostility is a very basic drive; it served to provide food in earlier days. We had no idea what else might result," Levine answered.

"But did you do it?" the same heckler persisted.

"If there is another outburst of that sort, I will terminate this conference!" Levine glared at him.

In the ensuing silence Levine launched into the details of the isolation of the association center that accompanied hostility. He argued, briefly, the logic of how whole segments of the molecule had been eliminated from contention and outlined the computer calculations which had occupied several hundred hours of computer time. A new slide appeared on the screen, a brilliant red rectangle situated in the lower left-hand corner.

"There . . . there is the point of our quest," the researcher almost shouted. "By standard manipulations it is now possible to produce humans who will never hurt one another."

The room broke into chaos, chaos quieted only when one of Levine's assistants started clicking the room lights on and off.

"Wait, wait. You're forgetting the second half of the problem. We can eliminate war but we don't want to . . . the price is too high . . . it would mean extermination of the species!"

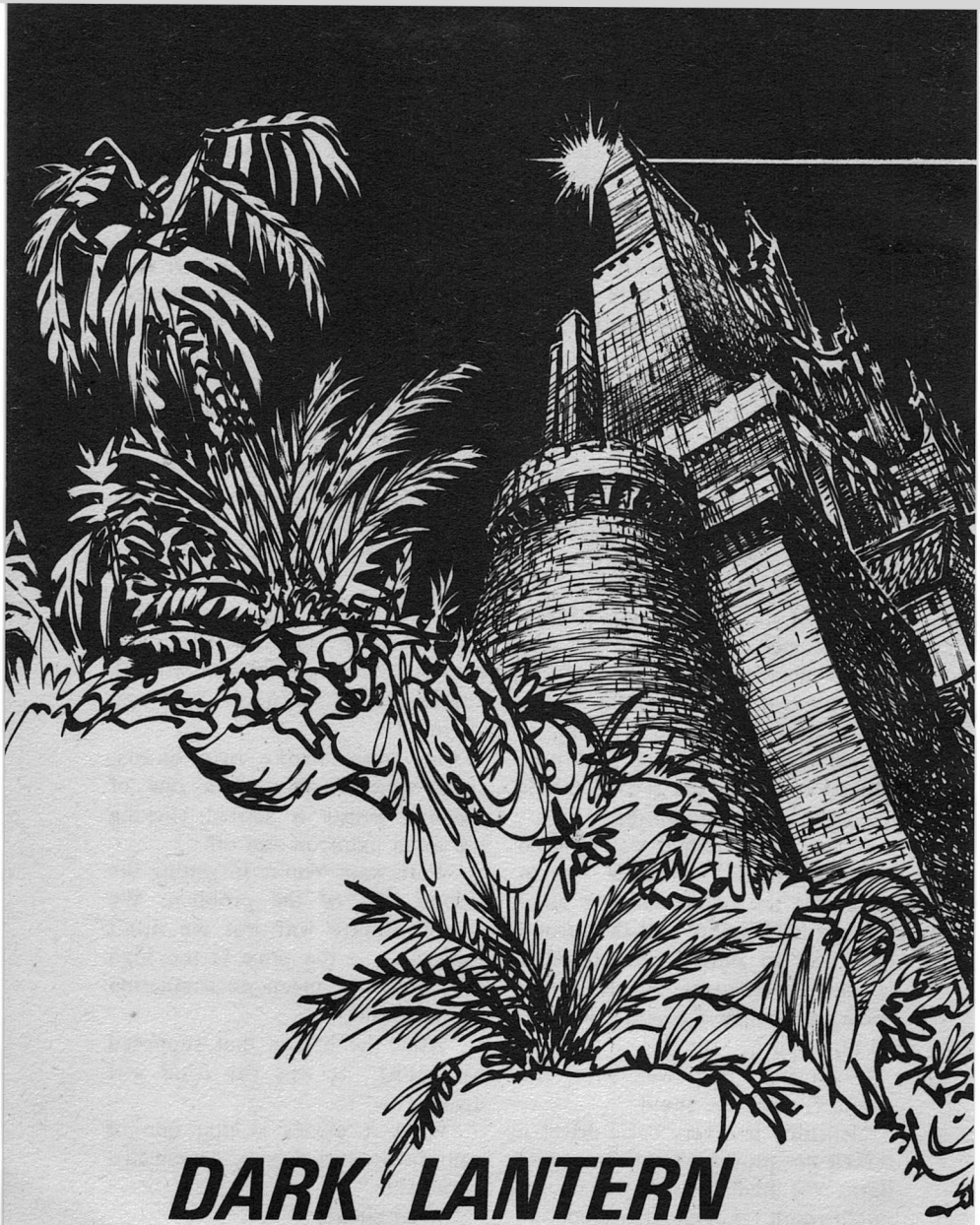
"What the hell is that supposed to mean?" It was the loud girl again.

"What it means is that one of your favorite clichés is, genetically, impossible."

"What cliché?"

Levine almost whispered.

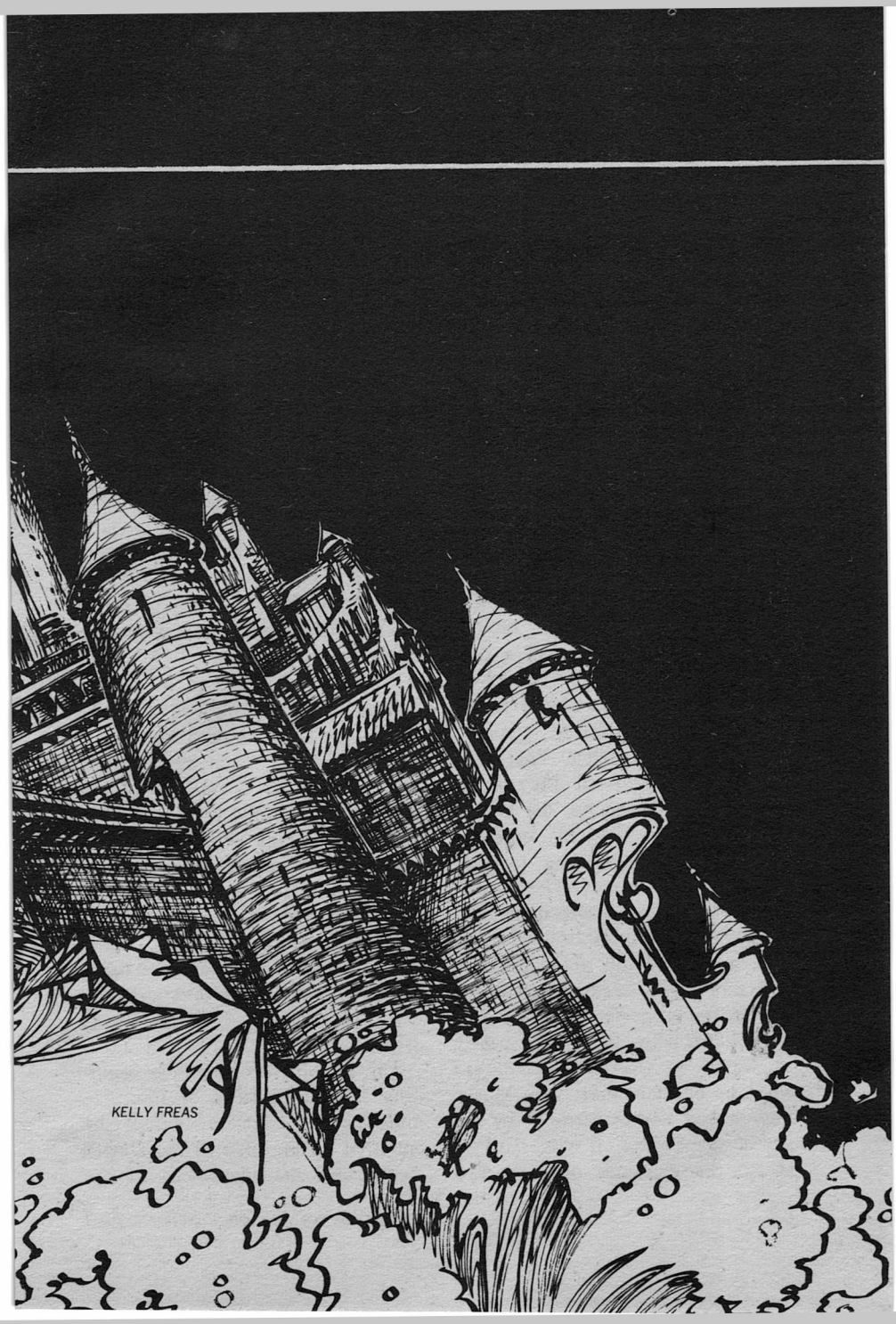
"Make love, not war." ■



DARK LANTERN

Tiger, tiger burning bright—can you change your stripes?

P.J. PLAUGER


KELLY FREAS

The light was elusive. Matacek strove to keep his legs moving rhythmically in time to his breathing. The water around him seemed filled to overflowing with the sounds of inrushing and outbubbling air. But the dancing light disrupted his wordless chant and broke into the regular succession of thrust and sweep.

A flicker to one side. He turned to look and his flippers tangled momentarily. Phosphorescence played mockingly about in the turmoil his legs created. Suck in, kick, kick. Bubble out, kick, kick. The compressed air tasted cold and damp, yet burned at his dry throat. His jaw ached from biting continuously on the regulator mouthpiece, and his wetsuit had a definite chill.

Ten meters overhead the setting quarter moon shattered across a thousand tiny wavelets. That must be the source of all the teasing glimmers, he knew, but the knowledge could not keep his keyed-up reflexes from responding to each dart as a new threat. This underwater world glowed with menace.

Up there lay a subtropical paradise, a composition of islands, sea and moonlight straight out of an airline travel poster. The air had been warm when he left the beach, as warm as the previous night when he had lain there with Maria, their naked bodies caressed by the gentle sea breeze. It was hard to accept the existence of these two such different environments in close proximity.

But Matacek had planned as carefully as ever. He had spent a week with the scuba instructor from the dive shop, exploring the reefs and covertly studying the passage out to the Devil's Rocks. He went skin diving among the shallows, to perfect his surface dive and improve his breath-holding ability. Clad only in trunks under the baking sun, he could still appreciate the need for thermal insulation on a long night swim, and had insisted on a sweaty wetsuit practice session over the instructor's protests. The man probably thought him another daft tourist. But Matacek's specialty was survival, and he knew his business well.

He would have liked to surface and check his bearings, for the currents were tricky around the Rocks. A lot of good men had already died making this swim—the natural hazards were surely responsible for a number of the casualties. Statistics, however, proclaimed loud and clear that there was a human element involved that was far more malicious than tide and rocks. Matacek chose to face the natural dangers head-on and remain hidden from searching eyes for as long as possible.

The bottom was definitely beginning to rise in front of him. He must be on course. Mentally he conjured up the map of the Devil's Rocks and the placement of the

castle relative to the few known soundings. The landing was straight ahead, with its protecting jetty off to the right. It would be safest to enter the little harbor crested by the jetty, so safe that he had early ruled that possibility out entirely. Any traps or warning systems must surely be concentrated there.

No, it would have to be on the seaward side or not at all. He cringed at the memory of wave after wave attacking those rocks. There was a whirlpool visible almost continually just two hundred meters from the jetty. That portended vicious side currents and undertows in places unpredictable from the surface.

For three nights he had maintained a constant surveillance of the Rocks, in all stages of the tide, before he saw his approach. Through binoculars, it was just a narrow band of calm water, and it only appeared for about half an hour midway through the flood of the tide, but it would serve his needs. He must literally sail between Scylla and Charybdis, between the breakers on the jetty and the hungry whirlpool to seaward, but he knew he could make it.

Moon, wind and wave dictated that he make his assault tonight. He was on schedule. Yes, there was the anchor chain for the channel buoy. Angle off to the right. More. One hundred strokes. Bubble out, kick, kick.

The environment changed rapidly as he left the lee of the jetty. No longer did the light mock him. The waves were wide and rolling, they grabbed moonlight in scoops and spread it across the sky in broad wet swaths. He could hear a dull pounding over the noise of his breathing. The brooding menace of the bay gave way by stages to open defiance.

Matacek felt an insistent tugging, a cold hand urging him toward where the whirlpool usually lay. It was time to surface. Automatically he looked up and extended an arm upward, as he had been taught. Breathe out, come up with your bubbles. Breathe out. He remembered to change over to his snorkel just before he broke the surface. The tanks were more than half-full—and Matacek had every intention of making a return trip with them.

He blew the snorkel clear and took a quick look around. He was too close to the whirlpool! Grimly he drove his legs against the clawing current, angling toward the rocks where the vortex was more disrupted. He sucked air in great hungry gobs and tried not to gauge his progress too soon. After a hundred strokes, he was closer to the Rocks, and certainly no closer to the center of the whirlpool. Another hundred strokes and he was definitely gaining on the current. A hundred more and the looming surf was now the enemy.

The tidal pool was closer to the

jetty. Its entrance to the sea should be sufficiently submerged by now to permit safe passage. His reconnaissance convinced him that the narrow tunnel was the only chink in the natural fortification of the seaward side of the Devil's Rocks. It was his one chance to enter undetected.

There was the lion's head he remembered. Just a little farther. He switched back to compressed air, dropped to five meters and streaked toward the spot where the hole must be. There it was! A wave threw itself against the rock overhead and he felt the countersurge dragging him back. No time to ponder—ride the next one in! Suck in, kick, kick.

He reached the jagged mouth just as the water shattered above him. He grabbed rocks, scrambled, wedged a foot just in time to meet the surge. On the next wave he was through and floating in the relative calm of the pool.

Blackness. The moon had set during his last mad rush, leaving only the hard bright stars and the nearby channel-markers to light his way. He ditched his tanks and unpeeled the wetsuit. Dressed in trunks and diver's knife strapped to his calf, he was ready for the assault. Matacek believed in traveling light.

The rocks dug into his bare feet; a week of new calluses offered scant protection. There was beach grass to his left and a path, he knew. Grass portended sand and easier traveling. But he didn't want to chance missing the way and blundering about unprotected amid the razor-edged leaves. Besides, the path was a natural place to prepare a trap. He continued to climb and crawl gingerly among the rocks.

He felt the loom of the wall long before he noticed it against the night sky. At that, it was more an absence of stars than the presence of anything with a definite outline. Matacek spent a full ten minutes covering the last fifty meters, feeling for trip wires every careful step of the way. All his senses were keyed to the wind, the ground, hunting for any hint of strangeness in the neighborhood. More than once in his career had he evaded death because of some warning feel of *wrongness* that he could never quite put his finger on, even in retrospect. The desire to *survive* strummed along his nerves.

Cold stone brushed against his fingertips. He was at the wall. Stillness enveloped him, and he suddenly realized that a persistent sea breeze had been playing over him all along. Only when it was blanketed by the castle wall had he noticed it by its absence. Fingertips brushing the stone ever so delicately, he made his way toward the seaward corner and the drain.

The smell of stagnant water heralded his discovery. It was just as Maria had described it, bars old

and rusting but still quite intact. Except for the loose stone. Yes, there it was. Fingers traced the outline, rocked it gently. It was big and deeply embedded, but it looked possible.

Matacek unsheathed his knife and set to work on the dirt and rock chips around the stone. He worked silently and steadily, not wishing to make a disturbance now and waste his laborious approach. The grouting piled up slowly around his ankles.

That should do it. A tug. The stone slid out a centimeter and got hung up. He rocked it in place. More grouting sprinkled down. Another tug. Almost. To hell with it. Matacek heaved and the stone came free and rumbled out of its centuries-old bed. Squeals and rustling mingled with the final thump. Rats!

He could see red eyes throwing starlight back at him from their dank lair. There were over a dozen of them. Big. He held the knife ready in one hand while he bent down. Keeping his eyes fixed on the pack, he felt around for some small stones, picked up three. He threw the first. Eyes winked out as the squeals rose up. He threw the second and the rustling moved farther down the pipe. He decided to keep the third stone for insurance.

Matacek sheathed his knife and laced his arms between the bottom bar and the gap that now lay unguarded. Head next, scraping an ear against splinters of stone. No good. He withdrew and reentered the hole with his back downward. Now he could follow the angle with the natural bend of his body. It was still tight.. He felt his back being flayed by the sharp edge of the gash he had made in the wall. His ribs were being crushed by the bars.

Then he was through and drawing his legs quickly after. Blood trickled down his sides as he rolled onto his knees. There was only a short way left to go. He crawled along the fetid tunnel, straining to keep his knees and hands out of the filth in the center and recoiling whenever his raw back touched the dripping roof. Matacek tried not to think of the typhus and other diseases that must be flourishing in the slimy water, or how much of the stuff was entering his bloodstream through a dozen breaks in the skin. He crawled relentlessly toward his goal.

Light streamed down from overhead, dim but easily discernible to his night-accustomed eyes. No sign of returning rats. It looked like he was going to make it. He reached the overhead opening and held his breath for a few brief seconds, while his ears sorted through dripping water and pounding blood for any sounds of danger. Then Matacek moved swiftly. He wanted out of there.

His back protested the cold rusty bars against his wounds. But the

grating moved. Steadying it with one upraised hand, he raised the heavy iron grille with his legs until it cleared the lip of the hole. Then with a final overhand heave he skidded the grating to one side and sprang out of the sewer.

An empty corridor. Light splashed around the bend far ahead, the sole source of illumination. Behind him, he could barely make out the seaward door to the castle. It was bolted and barred. Also bugged and booby-trapped, no doubt. There was no percentage in going that way. What he was seeking would be where there was light. He set off.

There were doors opening off the corridor to either side, heavy iron-studded doors anchored firmly to the stone portals. These must be the dungeon cells from the old pirate days. Brave men still shuddered in the island taverns when they spoke of these man cages. Many people had rotted here over the years because they had displeased whoever the current landlord happened to be. Bravery was of little use to a penned animal.

Finally the cells came to an end, much to Matacek's relief. The corridor walls were uninterrupted and smooth the rest of the way to the bend. Still no sound or other sign that he had been discovered. He relaxed perceptibly.

When the floor began to tilt he knew he'd been thoroughly had. The slab was massive and already well-overbalanced by his weight before it let go. Even barefoot, he lacked the traction needed to scramble back above the pivot point. The walls offered no handholds whatsoever and the lip at the bend in the corridor was already out of reach. Such a simple, effective trap, it must date back to the earliest days of the castle.

He fell.

Even as he was falling Matacek studied the mechanism that had caught him and the room waiting to receive him below. He took the shock of landing and began spinning in place, scanning floor, walls and ceiling over and over while the light lasted. The slab slammed into place and blackness swallowed the room.

He reviewed the data he had accumulated. It didn't look good. A room three by six meters, the slab ceiling over seven meters high. There was a door on the pivot side and a mesh grille above it. The door had no knob. Only one piece of furniture in the room—a table equipped with old but quite serviceable manacles and, a ludicrous afterthought, a comfortable-looking mattress pad. Except for this modern touch, it could have been original equipment in the castle's torture chamber. Probably was.

Matacek felt his way along the wall to the door. Locked of course. The grille wouldn't budge. Well, no harm in trying. He fumbled toward

the table, examined it thoroughly by touch. Curious. There was a smooth metal plate embedded near the head of the table, just under the pad. He felt the stout timbers underneath and down along the legs. Nothing. The legs were bolted to the floor.

He could use the pad somehow, if anyone came through that door. And he had his knife. All he had to do was stay alert long enough and he had a chance. Then he heard the hissing of gas.

Quickly he unstrapped his knife and shoved it sheath and all deep under the pad. Then he leaped up on the table and stretched to tiptoe. He tried to keep his breathing shallow as he counted the seconds. He could have been killed easily by now—surely the gas was intended just to knock him out. Hopefully the density would not be as great near the ceiling. He concentrated on counting time.

Dizziness stole up on him in growing waves. The hissing had not yet stopped. He felt himself going fast. With a last drunken effort he lowered himself to the pad and arranged his body in a posture of resignation. A darker darkness waited to engulf him.

The knife made a comforting pain in the small of his back.

Maria was crying. With his free hand Matacek wiped away her tears as he rocked her gently in the crook of a supporting arm. Crying women always made him feel helpless, but he had early learned that if you comforted them and didn't say anything they would eventually stop. He hoped it would be soon—he had many preparations yet to make for tomorrow night's swim. And he would need a good rest.

She was starting to settle down. He changed from wiping tears to stroking the flowing curves of her body. Both were spent from lovemaking, but a few erotic sensations might still offer a distraction. And he desperately needed more information out of the girl.

The sea breeze added its reassurance to his, and the warm sand cradled them. A blanket of stars spread its protection overhead. Matacek felt stirrings of regret that reality must intrude into this island dream world.

Maria was at the sniveling stage. He groped behind him for his pants, fished a handkerchief out of the back pocket. Blowing her nose, she was a pathetic little child, one who must take leave of a favorite puppy or playmate. She took a shuddering breath.

"You're going to die out there, Stan," she stammered, "I just know it. Please don't go. Please don't leave me." The plaintive tone was touching. But she was adding nothing new to his store of information. He assumed an air of braggadocio.

"Don't you worry about me. I've been in some pretty tight places before and always managed to get

out of them." One more ploy. "Besides, this time I have someone to come back to." He cupped a spherical breast.

She shook her head, more in despair than impatience. "No, no. You don't understand what you're up against. Nobody returns from the Devil's Rocks. Ever."

"You did," he replied jauntily. "About five o'clock this afternoon."

"Oh, you know what I mean." More impatiently. "I am Dr. Knight's housekeeper. He signals me to come out whenever he needs me. But even I am not permitted to spend the night there, and there are many rooms I mustn't enter.

"The men talk in the taverns. It is well-known that many have tried to reach the castle uninvited. A few wash up on the beach, but most just disappear! They say the Devil himself built that castle, and he feeds on men!" Her voice rang with simple conviction.

"Evidently the Devil doesn't like the taste of Dr. Knight." They had been over this before.

"I told you, he is an unhappy man. And he never leaves the Rocks. If he hadn't sold his soul to the Devil, then he is suffering some torment for past sins." Her theology was well worked out.

"Dr. Knight is very kind to me," she continued. "He pays well—to cover the inconvenience of all the boat rides, he says, but it is still very good pay. And he is always asking after the welfare of my family. He even gives me books to read."

"He is a bad man, Maria," Matacek said softly. "He has stolen some secrets from the government of his country, a government that paid him well for years of service. And it is he, not the Devil, who has killed so many men. All they wanted was to recover what was stolen."

"And have you not also killed?" Equally softly. He looked at her in surprise and with fresh respect. "It is not an easy thing to hide, being a killer. You don't have to speak of it or even hint about it. The ruthlessness shows through in everything you do."

Silence. After a while she continued in the strange new soft voice.

"I still love you, Stan. And I respect Dr. Knight. There is much violence in the world. We islanders see only parts of the bloody struggle, enough to know that we want no part of it. Whatever is between you and Dr. Knight does not affect me. I won't let it."

He barely heard the whisper.

"But I don't want you to die."

He held her in a fierce embrace.

"Then you must help me. I am going out to the Devil's Rocks no matter what. Anything you can tell me about the place will increase my chances of survival." He let that sink in. "Now, will you go over once again the layout of the castle and the surrounding paths?

And describe that loose stone by the drain as carefully as you can."

There was flat resignation in her voice, but she began. Matacek methodically correlated each part of her description with his personal knowledge obtained from long-range reconnaissance. Her verbal sketch of what she knew of the interior agreed with the floor plans he'd obtained last week from the British Consul. Nothing new surfaced in this repetition, so he didn't interrupt. Still, there might be something she said that would click later, so he forced himself to concentrate on her every word.

He rolled over on his back to stare up at the spangled blackness as Maria droned on. Must be a clamshell beneath him. He could feel the lump of it in the small of his back.

The British Consul knew his business.

"Here are charts and floor plans, plus Bischoff's last reconnaissance summary. We have reason to believe he made it to the Rocks, as far as the harbor, anyway. So his conjectures about the set of the current are probably correct." He tactfully forgot to mention that Bischoff's body had never been recovered.

Matacek leaned forward in his chair to look over the documents. He would study them closely later. Right now he was still trying to get the general feel of the islands and the case.

"Do you have anything more recent on what devices he may have brought with him?" Knight had been in charge of research and development for the Department for many years before his retirement. He was three months gone before they began unearthing all the projects he had kept hidden. They were still discovering things daily.

The Consul looked uncomfortable. "His ability to foil infiltration is uncanny. But the Devil's Rocks are formidable in their own right, and the castle was certainly designed to discourage unwanted visitors. No, we have no definite evidence that Knight has been using anything new.

"Except, of course, that damned 'lantern'!"

"He's still broadcasting, then?"

"Right on schedule, dammit." He was definitely ill-at-ease. As the liaison agent on the spot, he bore the brunt of the responsibility for the failure of each assault, there being no one else left alive after each try. This whole affair must be damaging his career pretty badly. Still, he was good; he visibly stiffened his proverbial British upper lip and continued. Matacek was impressed.

"He's still following the old rendezvous timetable for the Russian subs. And so are they, even though they were supposed to have changed a month ago. I believe it

was your outfit that dug up that intelligence." He cocked an eyebrow in delicate inquiry. Matacek could have told him quite a bit about that acquisition—he personally had brushed with death to obtain it—but long habit kept him quiet.

"Well, no matter. The point is, Dr. Knight's conversation still seems to be one way. Whether the Reds understand him or not is moot, but they're as interested as we are. Enough so to send a special boat in for each transmission."

He snorted. "Gets bloody congested out there, what with everybody doing their own monitoring. Should form some sort of co-op, you'd think."

The "lantern" was a modulated infrared laser. Its tight beam and high band width made it an excellent vehicle for covert communications. One of the first of Knight's secret files that the Department came across contained engineering specifications for the device and an efficient receiver. Knight had code-named the file "Dark Lantern."

"Are you sure that he's really broadcasting information? I mean, no one has cracked his code yet. It could be pure gibberish."

The Consul shook his head. "Our cryptanalysts swear that it's meaningful, even though they can't say what it means. Something about the entropy being too low. They claim it's English, in fact, because of its spectral distribution or some such.

"No. I'm afraid he is definitely trying to say something to the Russians. And with his background, he could have a lot to say."

That was the rub. Knight had turned out to be a real sleeper. In thirty-five years of service, there were few secrets that he had not become privy to. He simply could not be ignored.

"I suppose you'll be going out there," the Consul ventured.

"I have my orders." And the less said about them the better. Matacek leaned back in his chair, his eyes fixed on those of the Consul. The other man looked away first.

"Quite. Well, let's get on with Bischoff's report then." He opened the folder and began arranging papers, unsettled by the agent's brusqueness.

Matacek composed himself in preparation for deep concentration. The chair he was sitting in was one of those high-backed things you always see in old British movies. It was not very comfortable. He could feel an errant spring prodding him in the back.

The man was too nervous. Matacek had dealt with him on three occasions before, and he had always been jittery; but this time he seemed ready to bolt at any instant.

"Did you bring the money?" Between the stammering and the thick Russian accent, his words were barely understandable.

"Of course," he replied con-

temptuously. Matacek disliked dealing with amateurs. The risks were always much higher. He made a point of sipping casually at his beer as he looked around.

They were in The Cock and Bull, a shoddy imitation of a London pub on the outskirts of Washington. The place had been a biggish one-story residence, drowsing beside a lightly-traveled secondary road. Then along came urban sprawl, bringing the dubious fruits of a military research spending boom to the Maryland suburbs.

The highway outside was now four lanes wide and divided, buzzing night and day with people on the prowl. That portly gentleman behind the bar had bought the place for a song and got it rezoned and liquor-licensed, in the hopes of attracting some of the prowlers. Someone told him that a saloon had to have Style, so he settled on Victorian Ugly and opened the doors.

He guessed wrong. Sure, the place was packed on weekend nights with the *nouveau chic,* young dentists and lawyers whose wives adored the meretricious trappings. And by shelling out some of his scanty profits, the proprietor attracted the local college crowd three nights a week by hiring a genuine lute player who had an endless repertoire of off-color ballads.

But the real money in the saloon business lay in keeping a regular clientele—in fact a different set for each time of day—and in this The Cock and Bull failed. Laborers felt uncomfortable there. Collegians had too far to travel for a sixty-cent beer. Commuters and businessmen had to go out of their way just a little too much for a martini with a jumbo olive. As a consequence, the place was deserted more often than not. Matacek loved it for that reason—and for one other. It was the perfect place to conduct his sort of business.

"Let me see what you have," he replied at length. His contact hurriedly unzipped a leather portfolio tucked beside him in the corner of the booth and handed Matacek a thin sheaf of papers under the table.

"Please. Do not wave them around so." The man's voice cracked. Matacek ignored his fluttering hands and raised the papers for closer inspection. He knew only a little Russian—the Cyrillic alphabet was impossible—but it was easy enough to decipher the scientific cognates. The papers looked legitimate, and the man had always delivered reliable goods in the past. Still, there was a *wrongness* about them.

Matacek spotted the hummer almost immediately. It was in the form of a three-by-five file card, paper-clipped to the sheath. On it were scrawled the words "File Alpha." And there was no good rea-

son why a Russian attaché stealing Russian intelligence reports should brand them with a three-by-five file card written in English.

A hummer was a thin printed circuit transmitter that could be bonded even to the back of heavy stock paper. Making it into a sandwich that looked like a file card was trivial, and that made it even harder to spot. The moist electrolytic cells occupying most of the surface area could only put out a fraction of a watt for about twelve hours, but that was usually sufficient to tag a carrier long enough to run him to earth.

Matacek tilted the card slightly to catch the reflected light. He could see the familiar antenna pattern embossed near the side, and the score mark that started the battery action. Someone was on to this deal. He wondered briefly whether his contact was anxious because he knew about the trap, or whether his growing nervousness had tipped off his employers. It didn't matter either way.

"This looks fine," he said calmly as he reached down to unzip his own portfolio. He slid the papers inside, much to the other man's relief. Deftly he slipped the hummer from under the clip and, in the hidden confines of the portfolio, worked it into the middle of the stack of soiled twenties he had brought. His hand reappeared clutching the bundle of bills.

This time he kept the transaction completely under the table. No point in alarming the rabbit any further. Two zippers sounded simultaneously.

The man tossed down the last of his drink and slid out of the booth.

"Won't you stay for another drink?" Matacek couldn't resist the gibe.

"I must be back by nine. It is dark already. Thank you, but no." The fool hadn't even recognized the thrust. Definitely unprofessional. Matacek nodded a cold dismissal. The man fled.

Now to move fast. He was in the men's room before the proprietor looked back from watching the other's departure. He didn't lock the door and he didn't turn on the light. Instead, he opened the window wide, stepped up on the sill, then hastily back down. Two definite shoe prints remained on the sill.

He removed his shoes and climbed up on the toilet tank. Using just his knuckles, he raised the plasterboard cover to the attic entrance and gently pushed it to one side. No dirt or handprints, that was important. He tossed his shoes and portfolio up, then pulled himself up after. Just as carefully, he replaced the cover from above. This was the second attractive feature of The Cock and Bull.

A squeal of brakes and a loud thump came from outside. Racing on all fours along the rafters, he hurried to the air vent at the front

of the building. He was just in time to see the killer pick up the portfolio and drop another in its place. Then the man hesitated—he must have caught a glimpse of the dead man's face. Evidently he collected his wits quickly enough. He picked up the second portfolio, drew something out of an inner pocket and stuffed it partway into the bloody jacket. The killer was back in the car and on his way before the first spectators arrived.

Matacek was impressed by the speed of the operation, and somewhat amused at the Russian mentality. The fluttering scrap of paper showed a large Star of David. And the killer wore a yarmulke. How quaint of the Reds to implicate the Jewish Defense League in such a heavy-handed fashion while they took care of their own dirty laundry.

The alternate portfolio, the one designed to be found beside his corpse, must have been equally imaginative. It probably contained some embarrassing revelations about American espionage. No, the police would guard government secrets, even ones that made them angry. More likely it was Russian secrets, containing a large measure of truth for bait but laced with some deadly poison of misdirection. That was their style.

Matacek forced himself away from idle speculation, and away from the view. He collected his shoes and portfolio. They knew he was still alive now; they would be looking for him. Conceivably they might accept his false trail and think he escaped out the back window. But the men guarding the rear would be reluctant to accept the blame for letting him get away. He must be prepared for both search and siege.

There was a depression at one point under the eaves. It was invisible from the entrance; he had only discovered it by making a thorough search of the attic on his first visit. He brought supplies on his second trip, iron rations and water and a large can in case he had to relieve himself. It was not likely that the fat proprietor had ever been up here or ever would. On his next trip he brought a gun.

Everything was just as he'd left it. Matacek lowered himself into his hole, checked over his stores and made himself as comfortable as possible, under the circumstances. Tomorrow night the college kids would arrive in droves. He could come down then and mingle with the crowd. If he picked up a coed he'd have an excellent cover while he made his exit. Yes, that was the best course.

Light stabbed against the ceiling. Matacek froze. He could hear the cover being slid aside as the light grew brighter. Then something eclipsed the source. He heard heavy breathing. Matacek gripped the gun and waited. It was just like

being a kid again, hiding from the bullies. He could hear his heart pound.

The light flared up again, then was quickly snuffed out. Silence. Dimly through the cover he could hear guttural voices. Then they too were gone.

He breathed a soft sigh of relief. That had been too close. He wriggled about in the piled insulation, stretched to drain the tension from his muscles. He would have to feather this nest a little better if he were going to do any sleeping here. Through the rock wool he could feel a rafter digging into the small of his back.

"Hey, Stosh!"

The voices were coming closer. Stan Matacek hunkered down in the bushes and tried to still his frightened breathing.

"Stanislaus, where are you?" came the taunting cry. "Oh Staanley!"

"Hey Fred, do you think he's hiding? I mean, he might be afraid of us." The voice rang with cheerful cruelty.

"Naw, his old man's a cop. Besides, Polacks are too dumb to be afraid, didn't you know?"

"Hey Joe, does your father work?"

"Naw, he's a cop."

"Honest?"

"Naw, the usual kind."

Stan cowered in his hiding place, trying to hold back the tears of humiliation. There were three of them, all two grades ahead of him. They would beat him to a pulp if they ever found him.

"Let's go take a look at those bushes over there," came one of the voices. "They look dirty enough to hide a Polack cop's kid."

It just wasn't right. Stan's father wasn't like those stupid farmers who came over from the old country. In fact he'd just been promoted to sergeant. Policemen were the good guys; they made the streets safe for little girls to walk on. Stan clenched his fists in hopeless anger.

"Well, well. What do you suppose that is?" The voice was right in front of him. Stan looked down and realized that his white oxfords contrasted glaringly with the foliage. Resolution settled over him like armor. He stepped out to face his tormentors.

"Why, hello Stosh. Fancy meeting you here."

"My name is Stan." His voice betrayed him with a slight squeak.

"I never heard of no Polack named Stan before. Did you guys?" Much solemn shaking of heads.

"Only good Americans can be called Stan. Right, guys?" Nodding in agreement.

"I'm a good American." His tone was stronger.

"Gee, that's funny. Because we heard a rumor that your old man's a dirty Polack cop." A gentle shove.

"Don't you call my father

names." The boys were oblivious to the menace that had crept into his voice.

"Dirty cop." Shove.

"Polack." Shove.

"Dirt." Shove.

Stan screamed. He lit into the ringleader with both fists flailing, wheeled to bloody a nose on one side, turned to kick on the other.

"American! American! American!" Stan screamed. The world was a red blur.

The boys backed off, arms upraised. They fell, tried to get up, were battered down by the dervish they had unleashed. Finally they crawled clear of the flailing monster and escaped whimpering into the woods.

Stan came to his senses slowly. He fell blubbering to the ground, crawled back into his hole and curled up into a ball. After a while he slept.

When he woke up it was nearly dark. His mother was going to give him hell for fighting and being late for dinner. But for the first time in his life Stan didn't care. The new resolve was there to stay, the armor was impervious.

Never again would he give Evil a chance. He would fight for Right and he would fight to stay alive. He would fight for America. If necessary he would even kill. His father was a good cop and Stan was going to be a good cop too. Better.

Comforted by his resolve, Stan rolled out from under the bush. He was stiff. His knuckles were skinned and swollen from the fight, and for some reason his back hurt.

"Ah, I see that you are awake, Mr. Matacek." The voice came out of the darkness somewhere above and behind him. His back hurt. He tried to roll over.

Manacles clinked and checked him. He tested each limb in turn. All were fettered by cold iron. The chains were short, permitting little variation on the basic spread-eagle position. And the cuffs were tight. No, the left bracelet had some play. It would cost a lot of skin, but he might get that hand out.

"You do not reply." The voice again. "Permit me to introduce myself. Dr. Thaddeus Knight, semi-retired, formerly of your Department." A pause. "But then, you must know that since you went to so much trouble to visit me."

The hand would not come. He strained harder.

"I really must congratulate you, Mr. Matacek. You are the first one to make it all the way to my audience chamber under your own power. That means a lot to a man my age. It saves me having to drag you the last part of the way."

Sweat and blood mingled in the wreckage of his hand. It would serve as a lubricant. He ignored the pain.

"Let's see. You are the eleventh to make it to the Rocks alive. Bischoff told me there were seventeen

who tried before him. That leaves eight unaccounted for. We really need more lifeguards around here. I understand the undertow can be terrific."

Why wouldn't it come? Wait. Something was pressing into his palm. He flexed his fingers. The third rock! He'd actually carried it through the tunnel and held onto it while he fell without even thinking about it. That made one more weapon.

"I grow weary of monologues quickly, Mr. Matacek. If you don't wish to speak to me I will be happy to go away and leave you. For a long, long time." His voice became more distant even as he spoke the last words.

"Wait! I'll talk to you." He would rot here if he couldn't get Knight to open that door. He remembered the dungeons above.

"That's more like it. You see, I seldom entertain visitors for long here and I become quite hungry for gossip. You know. Shop talk. The good old days. That sort of thing."

"If it's intelligence information you want, you know I'm not authorized to discuss Department matters with retired employees." If the man were mad, he would play along with him.

"Tut, tut. Don't fret yourself over what *I* want. I have my own ways of obtaining information. After all, I said I'm only *semi*retired, if you recall." He chuckled. "I assumed that *you* would have a few questions. Or did the Department merely send you out here to kill me?"

"Not at all, Dr. Knight." That was near enough to the truth. Maybe the man was sufficiently demented to reveal the reasons for his defection. It would ease the cleanup job if they knew his motives. "We are all very curious about how you have been getting on since your retirement."

"Well enough, thank you. All things considered. I have taken up a new hobby, which has proved to be a considerable success." His voice had lost its bantering tone. "Do you want to know what it is?"

His hand was free. He tucked the stone next to his hip and began working his way toward the knife. His manacles clinked. "Yes, please tell me about it." Keep him distracted!

"I collect dishonest men."

His voice took on a faraway tone.

"The idea first came to me nearly ten years ago. I suppose it had been brewing for some time even then. You see, I didn't like what was happening to the Department.

"In the beginning, everything was clear-cut. The Germans and Japanese were the enemy and we all knew the price of defeat by *those* gangsters. It was easy to give your all for the intelligence effort.

"Then it was the Communists.

They were advocating the overthrow of the US Government by force and violence, so we knew they had to be contained. But Senator McCarthy showed me something I didn't like to admit—that seditionists had already infiltrated the government in the name of anti-Communism. I think that was when I saw the first changes."

He had a grip on the knife. Now to get it out from underneath the mattress.

"The Department became more and more political. We were no longer opposing enemies of the US Government, but enemies of the current administration. And I was deeply involved.

"One day I got a lab report from one of our brilliant young men. He had developed a hypnotic gas which was remarkably effective in assisting interrogation. At the bottom of the report he suggested, jokingly by his standards, that we might use it on some Democrats to find out their campaign strategy. They were talking about budget cuts in those days, you see."

He had the knife.

"Then I realized that there was a very good chance that the gas would be used for just such a purpose before much longer." He hesitated. "The young man was killed that evening in an auto accident. So I hid the report."

The words came in a flood.

"After that it was easy. If I saw something I thought might be of more use to internal espionage than against our real enemies, I bottled it up. As head of R&D with an excellent service record, I had no trouble with audits. I got better and better at hiding things.

"Then the Department started hiring a new type of agent. Not sensitive, freedom-loving men but ruthless, super-patriots who never questioned orders and would kill as casually as they might cheat at solitaire. I sent a letter of protest to the Chief, explaining the dangers involved in working with this type of psychological profile. But all I got was a polite 'thank you for your concern' and the practice continued. Had I protested further I would have lost my job and forfeited any chance of countering the trend."

There was a long silence. Matacek wondered whether he was expected to comment. But the scientist continued.

"It was then I decided to use the weapons I had kept hidden, against the real enemies of my country and world peace. It took my life's savings to buy this castle, but then I have no family and I felt I owed my life to undoing some of the damage I had helped wreak."

His tone became abstracted again. "There was too much information for me to take everything, too much to destroy at the last. I removed all trace of the nastier inventions and muddled the trail as best I could to the rest. Except for

the lantern, of course. That was my bait.

"Diogenes walked through the world with a bright lantern, looking for an honest man. I took the opposite approach. I stayed here with my dark lantern and allowed the dishonest men of the world to come to me.

"You are such a man, Mr. Matacek," he concluded.

"How can you say such a thing?" he replied quickly. "You hardly know me."

"On the contrary," came the confident reply. "You noticed the metal plate now under your head—it's another of my little toys." Matacek felt a twinge of fear.

"I told you I had my own sources of information. In conjunction with the hypnotic gas I spoke of and a few verbal suggestions, that induction plate stimulated you to relive a series of incidents in your life—I'm sure you remember them now. I unpeeled you like an onion." His voice became sterner.

"You are not a very nice man, Mr. Matacek. It was not necessary for you to mark that Russian informer for death. Perhaps he was going to be killed anyway, perhaps not. But you didn't even give him a chance. You could have just left the hummer in the booth and gained even more time for your escape.

"The last time I saw your personnel file, it said you had killed seven men. I wonder whether they have added his name to your list—or do you just get credited with an assist?" A pause.

"And you used my poor Maria very casually. The child will be heartbroken, and I'm sure you've impregnated her." Knight sighed. "I had hopes of sending her to school. She is so intelligent. But if I can't talk her into an abortion then she's doomed to a life of poverty. All because you needed a little information and decided to relieve your glands in the process of getting it."

"What about you, old man?" Matacek knew he desperately needed to get Knight angry enough to come within striking range. But he had no trouble forcing wrath into his challenge.

"Do you consider yourself so far above sin that you can pass judgment on others?" Matacek probed for his soft spot. "Do you have the right to broadcast your country's security information to the Communists just to bait your little conscience-salving trap?"

Silence.

"Well?"

"Nice try, Mr. Matacek, but you missed. In the first place, I feel very much the sinner. My hands are no cleaner than yours when it comes to murder, but at least I do have a conscience.

"As for my broadcasts, so far I've sent out 'Alice in Wonderland' and most of 'Through the Looking

Glass.' I'd like to put out 'The Hunting of the Snark'—somehow it seems appropriate—but I'm afraid the rhymes might show through the encoding, even though the code is changed randomly." Another pause.

"And I'm not salving my conscience. I'm merely exercising it as I see fit for the first time in decades. Believe me, it causes a great deal of pain."

"So you set out singlehanded to rid the world of Evil." Contemptuously. "You sound like a comic book hero."

"Yes I do, don't I?" He was still too confident. "No, I will not eliminate all of you before I'm stopped, but so far I've been making a pretty fair dent. That's enough for a start."

This was getting bad. Knight might be a madman, but he was an intelligent one. His delusion was thoroughly developed and unshakable. Getting him to come into the room would be next to impossible, particularly since he evidently knew about the knife. But he didn't know about the rock, or his free hand. Maybe.

"Whatever your plans are for me, Dr. Knight," he began, "I'm sure they don't include torture. You sound much too humane for that. Right now my back is killing me. I would appreciate your assistance."

A chuckle. "I'm sure you would. But you needn't worry, since I don't plan on keeping you alive to suffer much longer. I have all the useful information I can expect out of you, and I have a healthy respect for your resourcefulness. It is much safer if we end this business quickly."

He heard the sound of a gun being cocked.

Matacek fought down fear. He tucked the knife just out of sight and, clenching the rock tightly, snaked his hand under the confusion of chain around the manacle.

"You say you have a conscience. All right, then. All I ask is that you look me in the eye when you pull the trigger. If you're the man you say you are, you will do that." He waited tensely.

"You are right, of course." Light poured into the room. "But you forget the basic advantage of a gun—it is designed to inflict fatal damage from a safe distance. It would be silly of me to give up such an advantage, particularly when dealing with such a specialist in survival as you.

"I'm sorry, Mr. Matacek, but I'm going to kill you now."

Matacek wheeled and hurled the stone as the gun exploded.

The exhausted animal cowered in the brush and waited.

It had dragged itself out of the ocean scant hours before, taken air in tentative gasps. It pushed clear of the surf with webbed feet, clawed its way up the beach. Its

blood grew warm and it began slowly to think.

It was Matacek.

He was battered and confused, not so much by the physical ordeal of the past three days as by the assaults on his psyche. His mind felt bruised.

Back and forth went his thoughts between the disquiet engendered by his last interview with the Chief and the horror of his recent captivity.

Knight's bullet seared the skin along Matacek's spine, but the rock caught the old man square between the eyes. He fell dead just inside the doorway, well out of reach. It aroused Matacek's deepest fear, that he would die of thirst before he could escape from his chains. The scientist had been too clever by half; he had been almost as good at survival as Matacek.

"You're our last and best hope," the Chief told him. He sat at the head of the long rosewood conference table, flanked by his advisers. The Ivy League Mafia, Matacek called them. "We want very badly to recover what Knight took, but the price is getting too high.

"We'll give you seventy-two hours to escape or to take control of the castle and contact us," he went on. "Spiegel here estimates that you will either succeed or, ah, fail in that time." One of the nattily-dressed lieutenants glanced at the agent, looked quickly away. "After that we send in the Marines to dig you out." He beamed encouragement.

It took Matacek the better part of a day to cut the mattress up into strips and weave it into a net. How many times he cast it he lost count. It was like trying to work one of those penny arcade claw machines, he thought maniacally, only this time it wasn't saran wrap but *rigor mortis* that frustrated his efforts.

At one point he found himself talking to the fallen figure. The strong back-lighting made a halo of the old man's white hair. There was a priest who used to look like that, back when he was very young. Matacek confessed his sins over and over to the dead man, caught himself, laughed hysterically, caught himself at that, and went back to babbling between casts.

I am a fisher of men.

"We'll have a devil of a time smoothing this over publicly," the Chief went on. "There's a section working up a cover story, just in case. Still, an armed assault on a private residence can't be hidden and can't be explained to everyone's satisfaction. There'll be hell to pay. Not to mention the fact that we'll probably lose Knight before we can get anything out of him."

The Chief was always "losing" people. Evidently it was not possible to say "kill" with a Boston accent.

"So you see how heavily we're counting on you, Stan." The heart-

iness was back in his voice. "Don't force us to rely on a bunch of jarheads to clean up our problems." The Mafia chuckled in unison.

He fell asleep once, or thought he did. He struggled out of a bad dream, back into a nightmare. Knight's body was closer, but still out of reach. His arms ached as he lifted the net and cast again. And again.

The Mafia spelled out the details of the operation, each reciting his little piece. Matacek had trouble paying attention to their words. The detached singsong was just a background to his growing unease. He wished they would be quiet so he could work out what it was that was bothering him.

Matacek fought against shaking muscles to heave the stiffened corpse to table height. He was deathly afraid that the keys would fall out of the man's pockets before he could reach them. He missed them on his first search, in fact, because they were wrapped in a piece of paper.

It was a note.

There was a wrongness in the Chief's attitude, that was it, in the way his advisers looked at Matacek. He knew they regarded him as a blunt instrument at best. No, as a pawn—a passed pawn, perhaps, but still just a pawn in their complicated power struggle. Yet this was a different attitude entirely and Matacek was pretty sure what it meant.

There would be no Marines. Matacek would have to save himself or he would rot. The Department was sure he would be killed within three days if he did not succeed; that was what Spiegel's cold-blooded calculations really showed. The promise of rescue was just false assurance.

Matacek didn't like it, but at least he understood the reasoning behind such a decision. It was the sort of thing he might order himself.

"To my murderer," the note began.

"Congratulations on succeeding where so many have failed. You are a killer of the first rank. I bequeath to you my collection of nasties, and safe passage away from the Rocks. There are instructions for finding both, written on the reverse side of this message."

Matacek turned the wrinkled sheet over. There was a map and a list of directions. He turned back to the note.

"And now my condolences; for as much as you disagree with my methods and my goals, I bequeath them to you also. You have proved yourself worthy of them by killing me.

"Before you attempt to rid yourself of your albatross, consider this: killers never retire. They do not, they may not, they cannot. Test the truth of this before you decide what to do."

The Chief had an arm around

his shoulder and another clasping Matacek's gun hand a little too firmly. "Remember, Stan, you have seventy-two hours. Bring this one in for us, boy." Matacek disliked being pawed and disliked being called "boy" by a man only three years his senior. And he was getting tired of this farce about a rescue attempt. He never relied on the help of others; he would rather they didn't pretend to give it.

The note was honest. It led Matacek to water and food and safety and an iron box full of documents. There were no tricks, there were no traps.

The shape of the moon told him he had been more than two days in that hole. Spiegel was right, he admitted grudgingly; he could not have lasted three. He spent several hours combing the castle, but he found nothing that was not detailed in the documents. Tired as he was, numb as he was, he felt a growing sense of urgency.

Suddenly it came upon him that he wanted to get away, as far away from the Devil's Rocks as he could before sundown. He didn't know why. It did not make sense. He should rest and search some more.

Instead he fled.

And dragged himself ashore with his last ounce of strength to wait and watch.

Maybe he was wrong about the Department. Perhaps they were going to try to save him. He had to know; he could not resist making the test Knight suggested. He waited.

The explosion was blinding. Many seconds later the first sound hit him, then echo after echo from around the harbor. Matacek's eyes recovered in time to see huge stones poised hundreds of feet up in the air, before they fell back onto the Rocks or rained into the hungry waters. He hadn't heard the bomber and couldn't see it now. It must be flying very high.

Everything that could burn was ablaze. Nothing alive could have survived that holocaust. *They didn't even give me a chance.*

Matacek understood then why the Chief had emphasized the time limit even as he lied about the Marines. This really was the last effort to recover Knight's thefts; the Department was cutting its losses. And Matacek was to be casually written off with the rest.

Explosions were much easier to explain away than attacks by armed troops. Was it Spiegel who suggested this solution? Probably.

Matacek wondered what explanation they would have for him, should he come struggling into the harbor after a last-minute escape. The Chief was a fluent liar; it would be good. There would be supporting evidence, an apology from the pilot who accidentally dropped a salvo instead of a pre-attack pattern. General expressions of relief all around that he had survived.

Knight had been so right and yet so wrong. He understood the politics of murder, but he killed the wrong men. It wasn't the Mataceks and Bischoffs of this world that must be stopped—they were tools no better and no worse than Knight himself.

No, it was the Chief and his gang of cold-blooded intellectuals who were the real danger. They cared not for people or nations or even ideals so much as they enjoyed wielding their covert power.

Matacek was infected by guilt at having worked unthinkingly for such men. He could accept most of the things he had learned about himself these past three days, but not that. Knight had conquered death through him, just as the note prophesied. *Thy will be done.*

The Devil's Rocks had settled down to a bright glow across the water by the time Matacek stood up. He was stiff and weak and sorely in need of medical aid, but he hardly noticed. He started down the beach and promptly stumbled. It was impossible to walk forward in sand with flippers on, tired as his legs were, and he was too weary to take them off for the short distance.

Lying there, he remembered the iron box. He crawled back into the brush and located it by touch. It was a box full of death. He could almost feel it oozing down the cold metal sides. Death, death, and more death. Was there no end to it? He hesitated, then shoved the box deep in the foliage. It could go undetected for centuries.

Matacek wanted to cry. Somehow he felt that if he were still able to cry, perhaps things could work out better for him. Perhaps not. At any rate, he had lost the ability to cry. And that made him sadder.

There was no more time to lose, however. He would have to be discovered in the harbor soon if his story were to be believed. His blood felt cold. At least he would not have to fake exhaustion. He stood up.

He would have to husband his strength. It would be ironic if he were to drown before they fished him out, now that he had a real reason for living. He would not feel at ease until he could collect the iron box and stow its contents safely away at The Cock and Bull. The Chief, Spiegel, a lot of people were going to die with the help of that box, and it would take all his survival skills to keep from being one of them. It was high time he began planning for his retirement.

The light from the Devil's Rocks was guttering now; soon it would be out. It seemed to be tapping out a message to the world with its dying flutters, but Matacek didn't want to read it. Resolutely he turned his face away from the light and, backing down the beach on his webbed feet, retreated beneath the sea. ■

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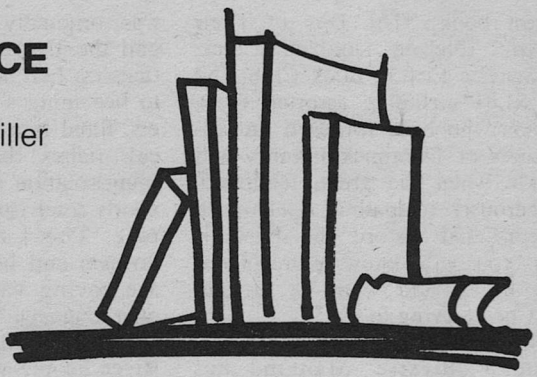


WORLDS

Speaking at the Science Fiction Research Association's Secondary Universe conference at Penn State University last September, veteran SF writer Jack Williamson told the new generation of SF scholars what the first days of science fiction were like. "We made worlds for ourselves," he said, "and found that we could share them with others."

World-making was the strongest single element of the early science fiction, and it is still one of the most important. Edgar Rice Burroughs' Barsoom and Pellucidar leap to the mind, but my own first memories are of Edmond Hamilton's stories in *Weird Tales* about a corps of Good Guys—men and monsters—who ranged the Galaxy and kept order among the myriad stars.

Hamilton had understood the implications of the "island universe" concept of cosmic structure before most astronomers did, and certainly before most of them accepted it. Where other "daring" writers peopled the star-worlds with replicas of Victorian heroes, heroines, and villains, he saw that other races as intelligent and powerful as we and probably more so would evolve out there, and that most of them would not bear even a passing resemblance to mankind.

Many others have gone on from there. Robert Heinlein's "future history" is probably the best known, and in special ways the most fully realized. Isaac Asimov's "Foundation" stories—Gordon Dickson's "Childe" ("Dorsai") series—Andre Norton's many books—all build on each other to create a detailed and ever-developing tapestry of the future. But nobody has given us or is giving us a more varied, more thoughtfully developed panorama of mankind's future among the stars than Poul Anderson.

Sometime I'd like to sit down with them all—books, short fiction, collected and uncollected—and reread it all. Most of it will show you more with rereading, because each new story casts new light on those which have come before. In his

newest book, "The Day of Their Return" (Nelson Doubleday, Inc. for Science Fiction Book Club; 182 pp; $1.81 including assorted fees), readers who have followed the adventures of Dominick Flandry will prickle when the great, feathered, dangerously telepathic Aycharaych appears—and before the book is over you will know more about who he is, and what he is, and what he is trying to do.

The book, then, is set in the Flandry universe. Mankind has spread out from Earth to the stars—has encountered other sophont races, notably the reptilian Merseian Roidhunate whom we are fighting tooth-and-nail, and the Ythrian winged people, with whom we have an uneasy balance in another sector of the Galaxy. The Polesotechnic trading empire of the Van Rijn cycle has risen and fallen of its own weight. A human empire has formed and crumbled and is about to disappear unless men of goodwill like Flandry, and like Chunderban Desai, Commissioner of Aeneas, can lash it together for a few generations.

Aeneas is one of those wonderfully realized worlds that Poul Anderson finds out among the stars. Heinlein may be better at showing you an intricate social system without ever letting you realize you are seeing it behind the plot and people, but nobody shows you a world with all your senses as Poul does. Aeneas is an old and dying world—after you see what a dead sea bottom would be like, magnificent and horrible, you'll look for Barsoom in Oz. Its human colony was originally a research station, and the University is now an elite that has become a caste on its way to becoming a race. There are others, fitted into their special ecological niches through centuries of semi-isolation from each other and nearly total isolation from the Empire. The Landfolk are feudal farmers and herders. The Tinerans are roving vagabonds with their own language—gypsies, and perhaps the descendants of gypsies. The River People whose ships trade on the great River Linn have Chinese roots. And the Orcans of the sea bottom are different from them all, for they live among memories and relics of the vanished Elders—who will return.

Who have returned, in fact—for the mind and will of one of them has impressed itself on a young Orcan shoemaker. Jaan is also Caruith, and he is the prophet of the Elders' return.

But that is only one thread of the shroud that is being woven around Aeneas. Young Ivar Frederiksen, Firstling of Ilion, has led an abortive attack on Empire marines and is a fugitive in the back country. Taking refuge among the Tinerans, he is joined by an Ythrian agent, Erannath of Avalon, a human/Ythrian world we have explored in another book. Meanwhile, Commissioner Desai—perhaps with memories of what imperial dominion did to his ancestral India (though his own home is Ramanujan)—is trying to reconcile the Empire's ruthless bureaucracy with the rising rebellion and the new crusade which somehow is not

a crusade. And out there somewhere is Aycharaych . . .

Ed Hamilton first showed us the immensity and wonder of the Galaxy. With Poul Anderson we live there.

THE BOOK OF FRITZ LEIBER
DAW Books, New York • No. UQ1091 • 173 pp. • 95¢

"The more that becomes possible to man, the more wildly he yearns for the impossible, and runs after witches and sorcerers to find it. While the farther he travels, to the star-ribboned rim of the Milky Way and beyond, the more he falls in love with far-off things and yearns for the most distant and unattainable beloved."

These sentences appear near the beginning of "Crazy Annaoj," one of ten stories and nine intercalary pieces that make this latest of Donald Wollheim's "book" collections one of the most interesting he has published. They say a lot about why we read science fiction and fantasy. They say as much about why segments of our society are finding science "irrelevant" and the irrational entrancing. And they are clearly something Fritz Leiber has known all along.

Do not pass over the book because you have tagged the author as a fantast with Fafhrd and the Mouser hung 'round his neck. They are here, indeed, but so is much excellent science fiction and so are a number of articles that Isaac Asimov might envy.

The fiction first. The book opens with "The Spider," a bit that raises more goosebumps than Lovecraft could, in a wholly different way: Gibby Monzer meets Ilkilikis. But then we have some excellent psychological SF in "A Hitch in Space," when a spaceman's hallucination becomes too real, and an almost short-short gem, "Kindergarten," that is a kind of quantitative SF. "Crazy Annaoj" is also very short: it projects history into space on wholly human terms. And "When the Last Gods Die" makes the future nibble the past like the Worm Ouroboros preening his tail.

"Yesterday House," restored to its original ending, can be many things: gentle fantasy, "straight" psychology, or some thoughts on the question, "What *is* time?" "Knight to Move" is a Change War story about a galactic chess duel with Snakes versus Spiders and the shape of the universe at stake.

Now, at last, we are slipping into fantasy. "To Arkham and the Stars" should be read, repeatedly and lovingly, with every serving of H. P. Lovecraft's mythos—a conceptual network which good and thoughtful critics and scholars insist *is* science fiction rather than supernatural fantasy. You can't really appreciate it unless you know Lovecraft, and it ties Lovecraft's alien horrors more firmly than ever to the New England that spawned him and his.

"Beauty and the Beasts" is, I think, the shortest Lankhmar story, and it's one of the best. And "Cat's Cradle" is about Gummitch, whom you may have met elsewhere. (Your own cat may know him, but if so, I'd be careful.)

The short articles complement the stories, set them off, and add a chef's touch to them. Some are SF-centered: about three of James Blish's novels . . . about Eddison's "The Worm Ouroboros" and a Mercury that never was . . . about monsters. But Fritz Leiber was for a time associate editor of *Science Digest*, so we can have quite factual pieces about molecules and the pronunciation of names. He is a chess master, so we have an article on the knight's move to complement the Change War tourney. He has been an actor, so there is a commentary on "King Lear." And he reads Lovecraft with clear eyes, so "Arkham and the Stars" is followed by "The Whisperer Re-examined."

Read it; you'll like it. And get someone who never reads science fiction or fantasy to read it, too.

THE BEST FROM GALAXY: VOLUME 1

Award Books, New York • No. AN1039 • 251 pp. • 95¢

With this paperback anthology, *Galaxy*, which earlier had a long series of hardback anthologies, is launching a new series. It covers the years 1969-1972 with thirteen stories, some almost traditional, some almost "New Wave."

My own favorites are the three stories that could be most properly called "hard science"—Larry Niven's "Rammer," James Blish's "Darkside Crossing," and Stephen Tall's "Allison, Carmichael and Tattersall." This is a relative classification, for in all three stories the psychological interplay of the characters is as important as the traditional science. In Niven's story, the society of two centuries from now has callously rid itself of the embarrassment of its cryogenically preserved "corpsicles" by putting them into new, brain-scrubbed bodies and sentencing them to a decade of public service as servants, in crafts, or at hard labor that nobody else will do. Corbett, in a criminal's body, is to pilot a Bussard ramjet on an interstellar run. He finds a way to gain his own ends. The tycoon in Blish's story (not too different from the protagonist of Robert Heinlein's "Man Who Sold the Moon") cuts himself off from his past and makes a way to visit the Sun's newly discovered companion star, Beta Solis. And the maverick trio who give their names to Tall's story, emulating the superscientists of John Campbell's and "Doc" Smith's era, solve the case of the vanishing krypton and discover the life of space.

The theme of the book is psychological. In Theodore Sturgeon's "Necessary and Sufficient," a talented scientist has discovered a politically and socially embarrassing method of population control that sterilizes only colored races. He must undo what he has done, and fast, but he has developed some sort of hangup. Problem-solver Merrihew is hired to get him off the hook—and does, by applying straightforward psychology. In John Brunner's "Out of Mindshot," a ruthless exploiter tracks down a young telepath hiding in the desert

and uses her talent to trap and torment her—until she uses it to fight back. And there's Milton Rothman's "Getting Together," in which a super-robot is using group therapy to make himself human. It builds up to a punning snapper that is a stereotype Jewish gag that is . . .

"Getting Together" has a kind of companion story in A. Bertram Chandler's "The Soul Machine." Again a robot is trying to become human—in fact, superhuman and master of the universe. But he has overlooked one implication of his own success.

There are two alien-among-us stories. In Joe Haldeman's "Out of Phase," a G'drellian "poet of pain," on Earth in his creative phase, amuses himself with the people he is about to destroy. But G'drellians go through nine phases. It is a rather grim little story, whereas W. Macfarlane's "The No-Win Spotted Tiger Planet" is comedy. Bradnow, the Mohmu masquerading on Earth, is the spotted tiger of the title. The Magworth effect makes other people invisible and permits dozens of objects to occupy the same space—but it doesn't work on "Brad Symon."

The population problem works itself into and out of the stories in many ways. It caused the problem at the root of Sturgeon's story and the telepathic clamor that drove the heroine of John Brunner's story into the desert. The accompanying "Traffic Problem" in Manhattan is the subject of William Earls' nightmare of urban life in 1981. England of the future has solved the problem by putting life on shared time—eight years of frozen sleep in Shelflife, then four years of Fulltime when people can live normal lives. The people of "The Sharks of Pentreath" operate a tourist trap in a Cornish village—but they have no control over what happens in those eight years of inaction. For that matter, R.A. Lafferty's unclassifiable "About a Secret Crocodile" could be considered a population explosion story if you draw your boundaries vaguely and keep your fences low. The Crocodile, of course, is the 8,809-year-old secret society which controls all the other secret power blocs which control all the people of the Earth. Then three unrelated people unknowingly threaten their supremacy.

We are left with one of Harlan Ellison's New Orleans suite of stories, "Pennies, Off a Dead Man's Eyes." It is one of his most human and effective, but is it fantasy or science fiction? Is the narrator a ghost or a mutant? Take SF out of its ghetto, and the questions become irrelevant: "Pennies" is simply a story about people, maybe living, maybe dead, maybe something else, and what they do to and for each other in a part of our world that most people don't see, or look away from if they glimpse it.

Even in *Galaxy*, the magazine that is probably closest to Analog of any, SF has the tremendous breadth that this anthology shows well. Lafferty . . . Ellison . . . Sturgeon . . . Niven . . . Brunner: maybe there should be no fences, after all.

COMMUNE 2000 AD

by Mack Reynolds • Bantam Books, N.Y. • No. N8402 • 183 pp. • 95¢

Mack Reynolds may have seen more of the world than any science-fiction writer, except possibly Arthur C. Clarke or Robert A. Heinlein. He is engaged in extrapolating what he sees to a baseline of the year 2000, and writing serious stories about what our world may become. In the process, he has become *persona non grata* in North Africa, the setting of his fine series for Astounding/Analog on the Third World's relations with the societies of waste.

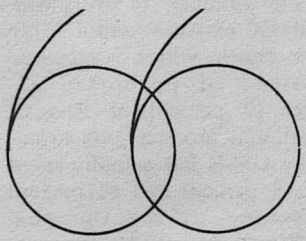
In this book he shows us a North America that has become a complete welfare society—and a nearly complete police state. Everyone can live, and live pretty well, on his Universal Guaranteed Income. He may not be able to qualify for the kind of job he'd like—there aren't enough jobs, for one thing—but he may very well be drafted for the physical labor corps, and there are forced labor camps for dissidents and boat-rockers.

Dr. Theodore Swain, a PhD ethnologist who can't quite make it to Academician but who fancies himself an expert on Aztec society, gets just the offer he has been looking for. He can do his dissertation on a comparison of the communes of the day with those of antiquity, and have the backing not only of his university but of two of the most powerful Federal agencies, the National Data Banks—who can't get data on the communes—and the National Security Forces—who consider them subversive.

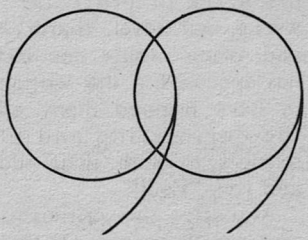
Circling out from New York, Swain begins to gather data on the nearest of the communes he can discover. He barely gets in the door at Lesbos, but finds the mobile-home artists' commune at New Woodstock more congenial. (A noted poontangler, he gathers data as efficiently in bed as out.) The Greek revivalists of New Athens are just as friendly, and so are the nudists of Nature, but at Jissom he is pumped full of LSD and sent out to kill himself on the winding mountain roads of the Catskills. He makes it, but a fellow investigator who rescues him isn't quite so lucky.

Finally the naive conformist scholar sees what the reader has known all along—that he is being used to get evidence that will enable the authorities to wipe out these maverick individualists who louse up their statistics and make their futures uncertain.

Details are good enough so that, considering the author's eye for social patterns, they should be much better. I can't buy his never having heard of Robert Owens, patron saint of the Nineteenth Century communes. If the Data Bank has obliterated all record of the Shakers, the Oneida Community, the Rappites, New Harmony, and many more, the fact should have been played up. Maybe Mack Reynolds feels more at home in the Sahara or Mexico than in the Catskills. If so, it's a pity—he has been a fair candidate for the award for political SF that is to be made this year by Florida International University.



BRASS TACKS



Dear Ben:

While your editorship appears to be providing more of a variety of stories and much better science fact articles than those found during John Campbell's stint with Analog, patterns are beginning to emerge, too. Be looking for the following from both pros and in the slush pile:

Item One: Multimillionaires deep in hock and threatened with bankruptcy and the destruction of an idealized dream project by jackals and people with short-range views.

Item Two: Heroes with Scots names and red-blooded American heroes with Italian names and Mafia connections.

Item Three: Stories based on blurbs from previous issues.

Item Four: First thirds of novels posing as novelettes.

Note: Item Four is found in just about all SF magazines. I deplore them wherever I find them. I do, however, understand that writers, too, have to eat. And anything over 1¢ per word is tempting. It's just that I'd rather see these things as first installments of serials rather than read so far only to discover that good development and good characterization have led to a trite conclusion.

Oh, yes, Item Five: Stories where people take the law into their own hands must be carefully selected or rejected.

JOHN ROBINSON
1-101st Street
Troy, New York 12180
And you only see the GOOD stuff!

We received a number of letters from readers about some of the data authors Nemeth and Walling included in "Earth, Air, Fire and Water" (February, March, April issues). Here's their reply.

Dear Ben:

One of the unpleasant surprises of authorship is that the readers so

often try to prove the writers wrong. Our novel, "Earth, Air, Fire and Water" (only one installment has appeared at this writing) seems to have inspired many adepts of the engineering and physical sciences to grab their slide rules and yell, "Foul!"

Actually, the criticisms we've seen run three-fold: (1) that we are raving, right-wing maniacs who've written a "depressing" tale, and therefore should be led out behind the nearest Birch Headquarters and shot; (2) digging "redoubts" as defensive hideaways for *that* many people (up to 25,000 per) would be thoroughly impractical; (3) collecting and storing a significant portion of Earth's atmosphere is a premise both silly and wholly unbelievable. Let's treat 'em one at a time, and God help us!

Not everyone, be it understood, who preaches salvation is Heaven-bound; Gordon Dickson hasn't accompanied any Russian cosmonauts on a voyage to Mars, though he wrote a fine, moving novel about same. Our point: neither of us necessarily shares the political or moral philosophies of any characters in our story. Nevertheless, though Famous Red-fighter Nixon has wound down the Vietnam War and established a *détente* with the USSR based upon sales of wheat (at a price we normally reserve for "underdeveloped" nations), SALT Talks, Henry Kissinger, and a seeming willingness to swallow whole the belief in peaceful coexistence with the Soviet autocracy, disquieting "rumors" continue to leak through the Iron Curtain. Example: the January 14 *Newsweek* article about ex-Ambassador Chip Bohlen's death which suggested that instead of purported expenditures (9 percent of Russia's "gross national product") on armaments, the USSR has actually spent between 41 percent and 51 percent on "defense" during the past decade. Why, one wonders naively, were all those missile-carrying destroyers, nuclear submarines, et cetera, funded by a nation whose avowed objective is peace? (*"Da, Tovarich;* that is all we desire—a piece of this, and a piece of that!") Governments come and go; dialectic tenets remain eternal: take two steps forward, then one step backward; two steps forward, then . . . you'll get there eventually.

Second, the redoubts. Surprisingly, no one has yet rushed forward to exclaim upon what an elegant, viable solution to America's mass transit dilemma the predicated ITTS systems would be, for selling this concept was the major reason the novel ever got written. We have considerable data which show how truly feasible ITTS would be, as well as a lot of material depicting the redoubts: the cubic footage required for each occupant, for service, air and water storage, hydroponic farming, and the like. Little of this got into the narrative for reasons of space. The redoubts are quite practical; witness the USAF installation under Cheyenne Mountain in Colorado. One astute gentleman pointed out that "only" .68 $mi.^3$ of rock need be excavated to effect *all* of our redoubts, and that this would be no

problem using the postulated nuclear boring equipment.

As for our much-maligned air theft conspiracy, Project Luft: vituperative denouncements have damned the Luft idea as crazy, as astronomically prohibitive in terms of time, money, energy, and materiel expenditures, air storage space, and what have you. We agree: it certainly would be all of these. *Much* more so than any casual reader could appreciate.

But *not* impossible.

Fiction has a fundamental purpose: to entertain. In order for it to be entertaining, the reader must enter into an unspoken compact with the writer known as The Willing Suspension of Disbelief—underscore *willing*—a much more difficult contract to negotiate with SF than, say, detective or adventure stuff. We tried our damnedest to make the "crazy idea" of Luft believable.

Lest any readers go away mad at this point, here are a few facts and figures we accumulated while preparing to write the novel. Air at sea level (14.69 lbs/in^2) weighs about 2,160 lbs/ft^2, or about 60 $\times$ 10^9 lbs/mi^2. The Earth's surface is about equal to 200 $\times$ 10^6 mi^2, thus the total weight of the atmosphere is about equal to 12 $\times$ 10^{18} lbs, or about 6 $\times$ 10^{15} mass-tons.

Ten percent of this amount—Luft's century-long objective—therefore amounts to about 1.2 $\times$ 10^{18} lbs. Assuming a collection rate of 20,000 CFM per compressor, an individual pressure vessel volume of 3.2 $\times$ 10^6 ft^3 (about 200 feet long times about 145 feet in diameter), and a storage pressure of 3,200 atmospheres (48,000 psi) a total of 1.6 $\times$ 10^9 tanks, and 18 $\times$ 10^6 compressors would be required to accomplish this overall goal.

Whew! But there's more: the postulated air storage methods (for Luft only, not the redoubts) would require about 8,000 mi^3 of tankage ("necklaces" of pressure vessels sunk in deep offshore waters to help compensate for the titanic internal pressures), tank materials with a tensile strength about 200 times those of present-day technology (which is up to around 300,000 psi), energy consumption equal to perhaps 15 times that of modern America, a truly phenomenal amount of materiel and manpower, and finances in excess of \$280 $\times$ 10^9/yr—about five times the present defense budget—or about 284 $\times$ 10^{11} *dollars.*

This makes Volpone's statement in 1988 that 7.02 $\times$ 10^{12} lbs of air per day was being collected by 3.25 million compressors sound conservative. But remember, Project Luft was barely getting off the ground at the time of the story. Even so, starting such an effort and maintaining even a slight lead over late-comers would be a devastating intimidation if the stored air were to prove vital to survival.

We also predicted that Luft's effects, however slight in 1988, would be first felt in the upper atmosphere, resulting in "malaise"—the affliction of peoples who've adapted to life in the Himalayan, or Andean, uplands. The latter makes a good example.

Sixty percent of Bolivia's inhabitants live on the Altiplano—a

sere, frigid, windswept plateau—at elevations up to 17,500 feet. Many work in the mines at 19,000 feet. Despite generations of adaptation (ever since Incan refugees fled upward from Pizarro's gold-hungry *Conquistadores*) they still suffer from *seroche*, the Andean term for Mountain Sickness.

Infant mortality among these Indios is the highest on Earth; the men earn their livelihoods underground, where air temperatures of 125° F are common, then return to unheated hovels and chew *coca* to numb the bitter cold. Marginal survival, at best.

It seemed quite reasonable to assume that, living as they do on the biosphere's upper fringe, it would take mighty little pressure drop (the Altiplano now ranges between 13 and 15 inches Hg) to force them toward a less lunar environment. The Bolivian government encourages this strongly even today.

Hypoxemic oxygen starvation begins when O_2 pressure in the blood falls to a point where hemoglobin is no longer fully saturable. Oxygenation and oxidation in the organ tissues—most importantly the brain—degrades rapidly. The symptoms are precisely those of migraine: a maddening headache, nausea, dizziness, loss of appetite—and malaise. O_2 quantity has little to do with *seroche;* it's a function of barometric pressure.

OK, then; the likelihood of Volpone and his pals, or their successors, getting hold of the gargantuan amounts of money, energy, and physical resources necessary to secrete 10 percent of the vast ocean of air surrounding us is very small.

But *not,* we repeat, impossible.

And that's enough. E. E. Smith kicked aside the inertia law with a single swipe of his Bergenholm, allowing Lensmen to chase Eddorians around the galaxy at 80 parsecs per hour. No one asked how. Star Trek's famous "Transporter" mashes people/objects into some sort of component impulses, then zaps them here and there at the speed of light. No one asks how.

The temptation to pause here and yell, "What'sa matter you guys; can't ya play the game for the game's sake?" is overpowering. Dammit, didn't anyone enjoy reading the *story?*

Secretly, we're glad that many learned individuals have taken the trouble to sit down and work out the mathematics of Luft for themselves; it proves the high-type readership Analog has earned and retained. Their attitude is, "Hey, we can't let these clowns get away with *that!*" It's a healthy attitude; would that everyone who reads newspapers, magazines, ballots, and bills before the legislature practiced it!

Several readers have also lambasted the editor for running the story. One gentleman was certain that the late John Campbell was whirling in his grave at thoughts of such drivel finding its way into the pages of his beloved magazine. We'll resist this one with vigor; Mr. Campbell also loved audacity. The Luft notion is audacious—and a helluva lot more probable than *much* other SF "business" we've seen.

A harsh reader-critic of *Gone*

With the Wind once wrote Margaret Mitchell a complaining letter. After a great deal of research, he'd discovered that, according to various Civil War battles mentioned in the narrative, her character, Melanie, had been pregnant a total of twenty-one months.

Undaunted, Mrs. Mitchell replied that Southern belles were accustomed to doing things at a much more leisurely pace than po' Northern ladies. The defense rests.

STEPHEN NEMETH
WILLIAM WALLING

Dear Mr. Bova:

Adapting a phrase that goes back to O'Henry, P.J. Plauger's "Wet Blanket" (February 1974) contains too much hocus-pocus of the focus and the locus. The "science" is a collage of sincere words and name-dropping, varnished with unsense.

Basically the idea of the story is sound, and Hahnemann, the protagonist, is acceptable as a partial blend of Einstein (thinking-wise) and Oppenheimer, mixed with a paste of today's back-to-nature movement. But the details are quite another thing. On page 115 the universe can be flipped, but not flipped back. On page 130 it could be flipped back. It is here that the story degenerates in the author's effort to find a compelling end. Rather than going "quietly insane," Hahnemann should have flipped. There are other difficulties—no science writer would snatch the microphone from the chairman of a session, and after a paper such as Hahnemann's he would be surrounded by his colleagues . . .

Despite all of this, and more, it is a good story.

J.W. Haldeman has not bettered "Hero" (June 1972). It is noteworthy that his "A Mind of His Own" and Plauger's "Wet Blanket" have the same type of ending.

P. Procyon Smith (why not Psmith, in honor of P.G. Wodehouse?) is a character in search of a series of stories. He, along with Schizzy Frehan, freed from Long Life might have a longer life of highly creative humor.

ALEXANDER D. WALLACE
306 East Gatehouse Drive, Apt. H
Metairie, Louisiana 70001

Hahnemann learned that the bistable universe could be flipped from one state to the other; he didn't know it at the beginning of the story. And the coincidence of the endings of Plauger's story and Haldeman's is one of those special corollaries of Murphy's Law that's reserved for magazine scheduling.

Dear Mr. Bova:

There is a logical flaw in the "Amphibious Cavalry Gap" story (article? trial balloon?) in the February 1974 issue of Analog. No attempt is made to establish the fact that the horses are riding-horses. What if they are draft-horses? Then an entirely different conclusion follows. An extensive *draft*-horse-breeding program would be directly related to the current energy crisis.

In farming, energy is used to produce more energy. For instance, in pre-revolutionary Chinese wet rice production: for every calorie of input (mainly in the form of human muscle power) there was a

37.5 calorie output in the form of rice.

Today in the US cheap, easily available energy has led us to the situation where for every five calories of input (tractor fuel, the power and resources used to produce pesticides and fertilizer, et cetera), there is only a one-calorie output of food. Energy-wise, though not dollar-wise, a system of deficit financing.

In the old days here (*i.e.,* pre-World War Two), this was not so. Horses, fueled on organic products and producing ten tons of fertilizer yearly, provided the motive power. Multi-hitches of eighteen or more horses driven even by fifteen-year-old boys pulled combines. You don't realize what horses could do until you read the contemporary propaganda against them at the time of their discarding.

Now the Soviet strategy is clear. By driving up the dollar cost of energy through manipulation of Middle East oil politics they will make food production prohibitively expensive for the US . . .

JOHN ANDROMEDAS
91 Onderdonk Avenue
Manhasset, New York 11030

"Amphibious Cavalry Gap" was completely fictitious. Wish the energy problem was too!

Dear Mr. Bova:

Your let's-draft-everyone-twice Editorial (February 1974) so drips with unintended irony that it resembles a Swiftian put-on.

"If we are ever to break up the governmental bureaucracies that surround us, we must be willing to put a few years of our lives into public service." Imagine the type of bureaucracy which would have to be *created* for the mammoth undertaking of drafting everyone twice. Fire does not put out fire. The notion that "we must be willing" is particularly amusing. When the only alternative is jail (as I assume you are implying), certainly most people would be willing! But why should force be necessary in the first place?

"Many Americans are finding that they want to change their life-style at about age forty." Anyone wanting to change their life-style should be free to do so *when* and *how* they want to. Keep the government out of it, please. "When each of us realizes that he or she is going to devote a few years of service to the community, we might begin to demand higher standards of performance from our government agencies." The first higher standard I would demand, in that case, would be that the whole draft-everyone system be scrapped. It interferes too much with the freedom to be left alone, and would necessitate a large expenditure of money and effort to mete out justice to those who would refuse to serve. It *is* a "crazy idea"—not because it is unlikely to happen but simply because it stinks.

Incidentally, January was the finest issue of Analog I have read to date; not one poor story. Keep up the good work.

MARC RUSSELL
431 South Elm Drive
Beverly Hills, California 90212

"Interferes too much with the freedom to be left alone," does it? That is PRECISELY the problem! Most citizens have insisted on being left alone by their governments, so that politics is left to the politicians. And are we being left alone? Certainly we're being left without power to decide war or peace, without buying-power to recompense us for our labors, without heat for our homes and fuel for our cars. How "alone" do we want to be?

Dear Mr. Bova:

It is inconceivable to me that anyone would seriously suggest that the Federal Government be given the enormous power to compel citizens to work two years for the government in some designated capacity. Yet I have before me your February Editorial, where you do precisely that.

Given government's propensity to intrude in an individual's life, I fail to understand why further intervention, via a civil draft, should be encouraged. And, somehow, I just can't square a civil or military draft with the Thirteenth Amendment to the Constitution: "Neither slavery nor *involuntary servitude* . . . shall exist within the United States . . ." (my emphasis).

Would you be willing to step aside as Analog's Editor for two years to write NASA tracts?

RUSSELL E. SALTZMAN
Assistant Secretary of State
for Legislative Matters
The Statehouse, Second Floor
Topeka, Kansas 66612

I've put in a fair share of time on the space program. And the point of Universal Public Service is to get the people to "intrude" on the government's bureaucracy.

Dear Mr. Bova:

I applaud your crazy idea of limiting officeholder's terms to two. In fact, the entire Editorial was stimulating.

How about letting me add a crazy idea of my own? It rests upon two basic cornerstones: the premise that there exist people who are devoted to the ideal of public service, and the crazy idea that at least a few of them put this ideal ahead of personal gain. On to the framework!

At the state level and above, an officeholder should be required to divest himself of *all* financial interests—in fact, he should be allowed to retain only cash savings and domicile property. The state should then provide him with a comfortable yearly salary for the duration of his term. Upon retirement—after two terms (to eliminate those for whom power is the ultimate goal)—he should be provided with a substantial retirement stipend. He should be legally prevented from making any investments during this period of time as well as during his term of office. Thus, he could not "set things up" while in office with the anticipation of collecting later.

This proposal would thin the ranks of the politicos, but we could then be assured that our politicians would not be swayed by pecuniary or power motives.

ARTICE M. DAVIS
309 Fafette Pike, Apt. 12
Montgomery, West Virginia 25136

Mightn't people go into politics to get those juicy pensions?

Dear Mr. Bova:

After reading February's Editorial "Crazy Ideas," I finally found my feelings expressed exactly.

Many people still think of SF as fantasy. Although there are a few exceptions, most of SF is based on fact, carried to its logical end.

If any reader knows anyone not yet converted to science fiction, my advice to him is to present the barbarian with February's Editorial. If it doesn't convert him, nothing will.

Perhaps the most amazing cases cited in the Editorial are the towing of icebergs, and black holes burrowing through space/time and emerging as white holes. Although I am not up on my astrophysics, as if I ever was, this seems a most interesting theory.

As for the stories, P.J. Plauger's "Wet Blanket" was by far the best selection. The most interesting point brought out in the story is the subconscious working apart from the conscious mind, and the Rheims Institute which taught the control of this portion of the mind. To my knowledge, nothing of this type is being worked on.

Although at first glance "Violence on TV" seemed average, I could not help but get involved in it. Perhaps what makes it enjoyable is the conflict between the average man and criminal.

On another subject, I would like to announce the formation of the Mathematical Recreations and Essays Society. The purpose of this society is as a reference organization. Contributions of material in the field of mathematics will be accepted at the address listed below. Later, after material is collected and filed, requests for information may be sent.

MARK RZCHOWSKI

22 JoAnn Place

Crestwood, Missouri 63126

There were lots of crazy ideas in February's issue, but everyone took the article on computer drawing in stride. That was a crazy idea twenty years ago!

Dear Mr. Bova:

Rousing cheers for your words about bureaucracy, on page nine of your much-enjoyed February issue! It couldn't have been better said.

Those words lead me to sound an alarm. Right now, at least two of America's most vital industries are squarely in the sights of powerful advocates for their "nationalization"—which is to say, their delivery into the hands of bureaucrats. Totally, rather than partially as at present. (After them—who knows? Who is immune?)

Worse yet, there seem to be plenty of people who apparently think this move would be a good idea. Wel-l-l—yes . . . one result *could* be a price drop in petroleum products. (The products themselves might even become more available, though I doubt it.) And rail services would probably improve, as they have in the case of the nationalized European lines. Unquestionably, very desirable results.

But you'll have noticed that I said, "*one* result"—or class of re-

sults. In view of your words about bureaucracies, I'm sure you will agree that these might not be the only results. My guess is that one of the principal side-results would be that the costs (not prices, *costs*) of the goods and services involved would go up horrendously. Like threefold, just for a starter.

This rise, of course, wouldn't be the least bit obvious. Why should it be? Those costs (which in a business would be called losses) would as usual be absorbed by the Poor Bloody Taxpayer—specifically, you and me. A nationalized oil and/or rail industry could just as easily (except for appearances) *give* away their product. No charge. It would be quite correct for them to say, "Help yourself; you're already paying for it!"

Quite true. Paying not only for it, but for the livelihood of a rather large number of bureaucrats.

All of which brings us to a very fundamental topic: the difference between a bureaucracy-run operation and a business-run one. That difference: in the case of the bureaucracy, there is no real test of performance.

What's performance? I suggest two factors: effectiveness and efficiency. As to the former, even a bureaucracy can meet simple and objective standards, such as, "Run the trains on time." (If the standards read something like, "Abolish poverty," forget it. We have seen their effectiveness with that one; just take a look at the HEW-related items in the Federal budget for the last ten years.) But . . . at what cost?

Cost . . . *that's* where the difference between bureaucracy and free enterprise really leaps out at you. A business-run operation *does* have a test of performance: the bottom line on the P&L sheet. It's the best test ever devised . . .

Which is a pity, because the net result is that we all live more poorly than we might if "free enterprise" were allowed to be truly free.

CHARLES H. CHANDLER
1296 Worcester Road, Apt. 2115
Framingham Center, Massachusetts
01701

It's not quite that simple. For decades, our post-industrial economic system has not had a free marketplace. Where mammoth corporations can control demand and/or supply, they also control prices. This is one of the reasons for the so-called energy crisis. Nationalization may add a huge burden of drones to an industry such as petroleum or the railroads. But it may also give the average voter a say in the operation of those industries. Is the quid *worth the* quo?

Dear Mr. Bova:

Regarding your Editorial in the February edition of Analog, it sounds like you are proposing a few ideas that I, too, have had for many years.

Our government is supposed to be of, by, and for the people, but lately (last 25-40 years, or so) it seems that the government is of, by and for the government.

My crazy idea is that communications systems are becoming good enough to allow the general public

to have a more direct voice in affairs of state. The government should begin a decentralizing program, perhaps using computers, and become more of a poll-taking or public opinion coordinator so that the government can do what the people want, instead of what the government officials want.

I also like your idea of young people having a larger part in their government. I don't like the blatant age discrimination found in the offices of representative, senator, and President. I wouldn't mind being able to be the first twenty-two-year-old woman President. Might just shake some of the dust out of the cracks.

One of the television station presidents recently said in an editorial that the state of Washington's Public Disclosure law might just bring more honesty into the system.

My father believes that public officials should be volunteers, and not paid at all, except for expenses incurred on the job.

These are a few of my, and other's, "crazy" ideas. I only hope some more ideas like them get into general circulation before it is too late to do anything about them.

DIANNE EASTMAN
2030 Dogwood Drive SE
Auburn, Washington 98002

Interactive TV could go a long way toward making government more responsive to the people's immediate desires. But are the IMMEDIATE desires the best ones, in the long run?

Dear Mr. Bova:

Your Editorial on Crazy Ideas was not so crazy; it was magnificent, and I couldn't agree more, particularly about terms in Congress. I have been saying for years that Congress should be limited in the number of terms allowed.

Seniority and the pecking order in committees are the reasons for my advocating this unpopular idea. By the time a junior legislator climbs up the ladder of power, he has a backlog of favors to repay.

I think first we should retire the overage senators and representatives, of whom quite a few are over sixty-five. Then a certain number of terms, whether short or long, should be set by law.

When we make it harder to stay in politics, the people who are supposed to represent us may start to do so.

ROBERT DYKSTRA
3124 45th Street
San Diego, California 92105

Thanks. But please explain how to define "overage." Winston Churchill was sixty-six when he first became Britain's Prime Minister.

Dear Mr. Bova:

I agree with your Editorial in the February issue. The only change I would make would be no exceptions. The lame man can tell the blind man when the bucket is full. It should not matter if the service is armed forces, VISTA, Peace Corps, local hospital, et cetera.

This should cover a two-year period after a youth graduates from high school, and preferably be in a part of the country different from where he was living when he graduated.

Another idea I would like to see put into effect is that no one should be granted a driver's license until they are either twenty-five years old or have a high school diploma. That should put all the dropouts back in school, with the bonus of teachers no longer having to look for parking spaces.

To finance additional needed schools, the admission price of all sports events should be doubled. The extra would be used for building schools.

ROY W. DANCY

RR 5, Box 1341
Dothan, Alabama 36301

More "crazy" ideas?

Dear Ben:

We had a small SF convention in Ann Arbor a couple of weeks ago. It was almost an impromptu affair, very modestly advertised, and that only locally, and to the promoters' intense surprise it drew more than eighty people and didn't even lose money. They'll probably try to make it an annual affair, but none of that is why I am writing.

At the convention, the most discussed SF development was your ANAlog, back-of-the-front-page calendar. I can't recall anything that's happened in recent years that got such a unanimous vote of approval. More than that—an enthusiastic vote of approval.

And I add my own congratulations on your doing the thing up in striking typography. The page looks as though you care!

LLOYD BIGGLE, JR.

We do care. And we're glad you readers find this new feature useful.

Dear Mr. Bova:

Perhaps the following might make an interesting start toward the SETU list mentioned in April's Brass Tacks:

"We cannot make apparatus small enough to disintegrate or fuse atomic nuclei any more than we can make it large enough to go to the moon."—J.B.S. Haldane

"The demonstration that no possible combination of known substances, known forms of machinery, and known forms of force can be united into a practical machine by which man shall fly long distances through the air seems to the writer to be as complete as it is possible for the demonstration of any physical fact to be."—Simon Newcomb

". . . aeronautics will never come into play as a serious modification of transport and communication."—H.G. Wells

". . . imagination refuses to see any sort of submarine doing anything but suffocating its crew and foundering at sea."—Wells again.

"This is the biggest fool thing we have ever done. The atomic bomb will never go off, and I speak as an expert in explosives."—Admiral William D. Leahy (1945)

"Who is interested in such a useless, ridiculous and indecent contrivance so long as there are horses for sale?"—Local newspaper commenting on Karl Benz' building of automobiles.

ROLAND L. PORTER

12480 Culver Boulevard
Los Angeles, California

How about: "Space travel will always be too expensive to be practical."

continued from page 8

If the speed of light is a limit on communications, then there can be no interstellar empires. The distances between the stars are so vast that it would take generations to get information from one star system to another. Even if we get around the light-speed limit in some manner, it would appear that starflight would take so much energy—like the energy output of a star itself to propel a modest-sized ship—that interstellar flight would be fantastically expensive and thus very rare. Instead of an empire, there would most likely be a loose confederation of stellar systems, linked tenuously by the occasional visits of prohibitively expensive starships.

Yet we keep seeing stories that blithely assume an interstellar empire with a political structure not too far removed from the Roman and British models. When is a writer going to sit down and figure out how an interstellar community might actually behave? Poul Anderson has come the closest to doing this, but the subject is vast enough for many, many writers to examine all the different permutations.

There's another piece of artistic shortchanging that too many writers pull on themselves. That's the story where the hero never sweats. No matter what heinous trap the villains have dumped him into, no matter how many generators have blown out, no matter that his girl has run off with an android and the extraterrestrials are merrily blowing up every city on Earth, Our Hero smiles grimly and does exactly the right thing. And he wins without even mussing his hair. The problem here is that the writer knew from the beginning that everything was going to work out OK, and he let it show in his hero's behavior.

All the action, suspense, problems are merely plot devices. We all know that the good guy will solve all the problems, conquer the baddies and win the girl. Instead of a story, we have a superman myth that gets more boring each time it's retold.

There are more editorial crotchets that we could examine, but I hope you get the drift of my leanings from these few examples. So much for worn-out ideas. Where are the new ones?

In the minds of the writers and readers, mostly. But here are a few you can mull over.

Science fiction has had its share of pirate stories. John Campbell himself wrote about air pirates, although most SF stories have dealt with piracy in space. Air pirates—hijackers—have become a reality. But modern hijackers don't use the same *modus operandi* as Cap'n Kidd and his swarthies, nor do they operate for the same motives. The technology and the society

have changed; so have the methods and motivations of the pirates. Assuming that there will be some form of piracy once interplanetary commerce becomes fairly commonplace, what will it be like? And why? What will be the pirates' motivations and methods?

Space piracy? Sure—especially if we have a Third Industrial Revolution and begin utilizing the raw materials of the other planets and asteroids, and ship them back to factories in orbit around the Earth. What kind of society will *that* be? Who will be rich and who will be poor? Which nations will grow stronger; which weaker? How will the oil-rich nations fare when thermonuclear fusion provides our energy and the asteroid belt provides our raw materials?

Staying right here on Earth, how about a society built on individual responsibility? For example, we now have a welfare system that takes tax money from earners whether they like it or not, and provides welfare payments for nonearners. Many taxpayers have complained that they would sooner pay for voluntary charity than have taxes taken from them against their will. Suppose we adopted a system where taxpayers are given individual welfare recipients as their personal wards, and get tax deductions for them? The welfare recipient would go *personally* to his or her "guardian" for support. There are a million different stories there, and at least one of them should be titled "My Brother's Keeper."

Astrology has turned to modern technology for help; astrological forecasting services use computers

in times to come

There are basically two types of writers: novelists and short-story writers. Rare indeed is the writer who can handle both forms with equal facility. Gordon R. Dickson is one of those rare individuals. His novels have justly won him a top ranking among the practitioners of science fiction; in fact, his novels have been so successful that Gordy has neglected the other side of his art, short-story writing. Those of us who remember "Call Him Lord," "Computers Don't Argue," or a host of other Dickson short stories will be well-pleased with his newest: "Enter a Pilgrim," which will highlight our August issue. But Gordy is being a bit cagy about it all, for "Enter a Pilgrim" will most likely leave you longing for a sequel.

The science article will deal with the split-brain experiments being done in neurophysiology laboratories. They give startling proof that every person has at least two sides to him!

Next month will also see the conclusion of Tak Hallus' "Stargate," and—space permitting—a funny short story by Joe Haldeman, plus several more stories by new writers.

to work out their mumbo jumbo (as Robert Heinlein suggested in "Stranger in a Strange Land"). The self-aware computer is a stock character in SF nowadays. But suppose a self-aware computer began making astrological forecasts for itself? And acting on them?

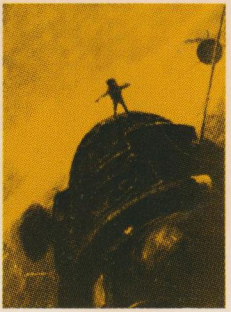
The ideas are there. The subject matter is just as open and wide as Isaac Asimov claimed. There's starflight, time travel, immortality, genetic manipulation, biofeedback, behavior control, telepathy, interplanetary colonization, the development of a "second generation" technology that turns one industry's pollution products into another industry's raw material.

But the most important thing to write about is *people.* Think of the stories you remember best, and the chances are you remember a character, a person whose problems and struggles moved you emotionally.

To paraphrase Alan Jay Lerner's paraphrasing of George Bernard Shaw, "By and large we are a marvelous race." The human race, that is. And *that* is what good stories are really about: people. People who face problems and strive to surmount them, who sometimes win and often lose but always *strive.* They may look decidedly nonhuman, and they may be anywhere and anywhen in the universe. But all good fiction is concerned with people, and the rest—the exotic backgrounds and clever ideas—are merely attempts to place the human spirit in a crucible where we can test its worth.

That's the ultimate idea of the Idea Factory.

THE EDITOR



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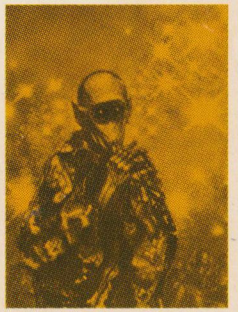

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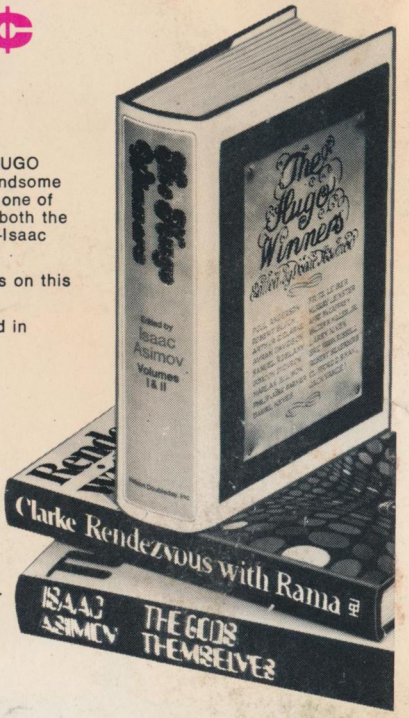

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