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DEATH OF THE SUN
By Willy Ley

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GALAXY
SCIENCE FICTION

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Cover by MEL HUNTER showing HOLD STILL, DAMMIT!

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I READ YOU

NOT very long ago, debunkers were about as numerous as bison. Now, in only a couple of decades, they've become almost extinct and should be given Federal protection.

It's a pity that the breed is vanishing. They did no harm, for anything valid that stood in their way was not toppled by their trampling rush, and they *did* uproot a stupendous amount of societal rubbish that we're better off without.

Well, at least we still have Bergen Evans, a very happy bison indeed, whose *The Spoor of Spooks* (Knopf) is a joyous romp through the lush fields of "scientific" nonsense.

Charles Fort would have used this rich book as another ax in his crusade, being faster on the drawing of conclusions than the researchers he was lambasting. Evans is just as quick to demolish irrational belief, even though he quotes Shaw on the law of the conservation of credulity: "the dispelling of one illusion seems to create a vacuum which draws in another." And Evans is as unable as Fort to resist overstatement, ridicule and outrageous puns.

Nevertheless, both are fine sources of ideas. I wish I could explore *The Spoor of Spooks* more fully than these two pages allow—Evans takes on everything from dowsing to idiocies in the law—but one chapter is especially important in view of a thematic trend in science fiction.

Evans calls it "Psi-ing in the Carolines"—I warned you about his puns—and his target for tonight is Dr. Joseph B. Rhine of Duke University, the champion of extra-sensory perception and psychokinesis.

For years now, I've been waiting sympathetically for good news from Durham, N. C. Let Evans tell you why there hasn't been any:

"The existence of Psi has chiefly been determined, to the satisfaction of those who believe in it, by the fact that certain people have allegedly at certain times identified certain cards slightly more often than certain other people believe constitutes chance expectancy . . . He (Dr. Rhine) does not claim that his

best performers can demonstrate ESP at will, but only that they have demonstrated it .36 or .23 'above chance'; and he must surely know that, under the circumstances he describes, truly scientific experimenters would make an allowance of that much or more for error of record."

Incidentally, the cards used are not normal decks; there are 25 special cards in five suits. This gives the subject a one-in-five chance at each guess.

Evans insists that a norm should be established by giving tests to large numbers of people. Then the exceptional person should be tested "until the results are stable, no longer altered by additional experiments. Then, and then only, can the tester be sure that he has established a difference between the individual and the group."

But Rhine won't do that, any more than he has agreed to intersperse blank cards in his special deck, claiming that "this would be a form of deception." When "promising" subjects begin slipping, he breaks off the experiment. But he keeps the positive findings as "evidence!"

Evans' appropriate comment is that, still better than winning at dice by quitting when you're ahead, "It would be even easier if you didn't have to play for keeps until you started to win and were allowed to ignore some of your bad runs because they weren't up to normal!"

Rhine claims that most scientists believe he has proved the existence of Psi. But "hundreds of thousands of tests have been made with his own cards without finding anyone who could guess them more accurately than chance expectancy would indicate."

It's true that "Those who belive in Psi . . . forget the prophecies that don't come true, the premonitions that prove groundless . . . The ultimate test of the validity of any experiment is that those who repeat it will get the same result."

Yes—once method and tools are found. Fire, for example, was used long before Man knew how to make it. Not being able to make it didn't mean there was no such thing.

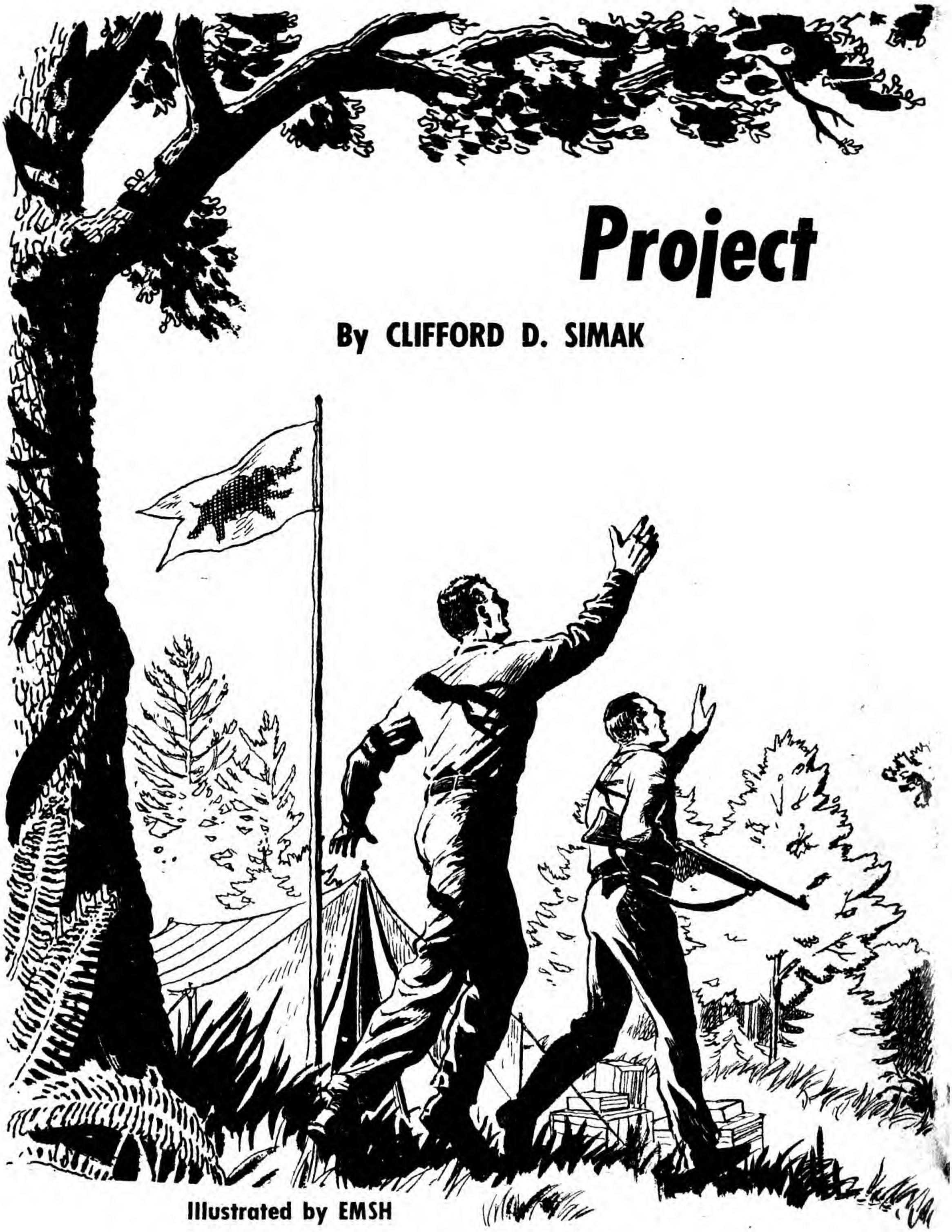
Evans hasn't proved his point any more than Rhine has. Like Flying Saucers, there's *something* there. We don't know what, but neither can we dismiss it by debunking tactics alone.

Whatever it is, though, Dr. Rhine's odd approach is more likely to obscure than locate it. A dismal fact, for we'd like it to be otherwise, but, to be entirely practical, we'd do well to look elsewhere for the latest news on Psi.

—H. L. GOLD

Project

By CLIFFORD D. SIMAK



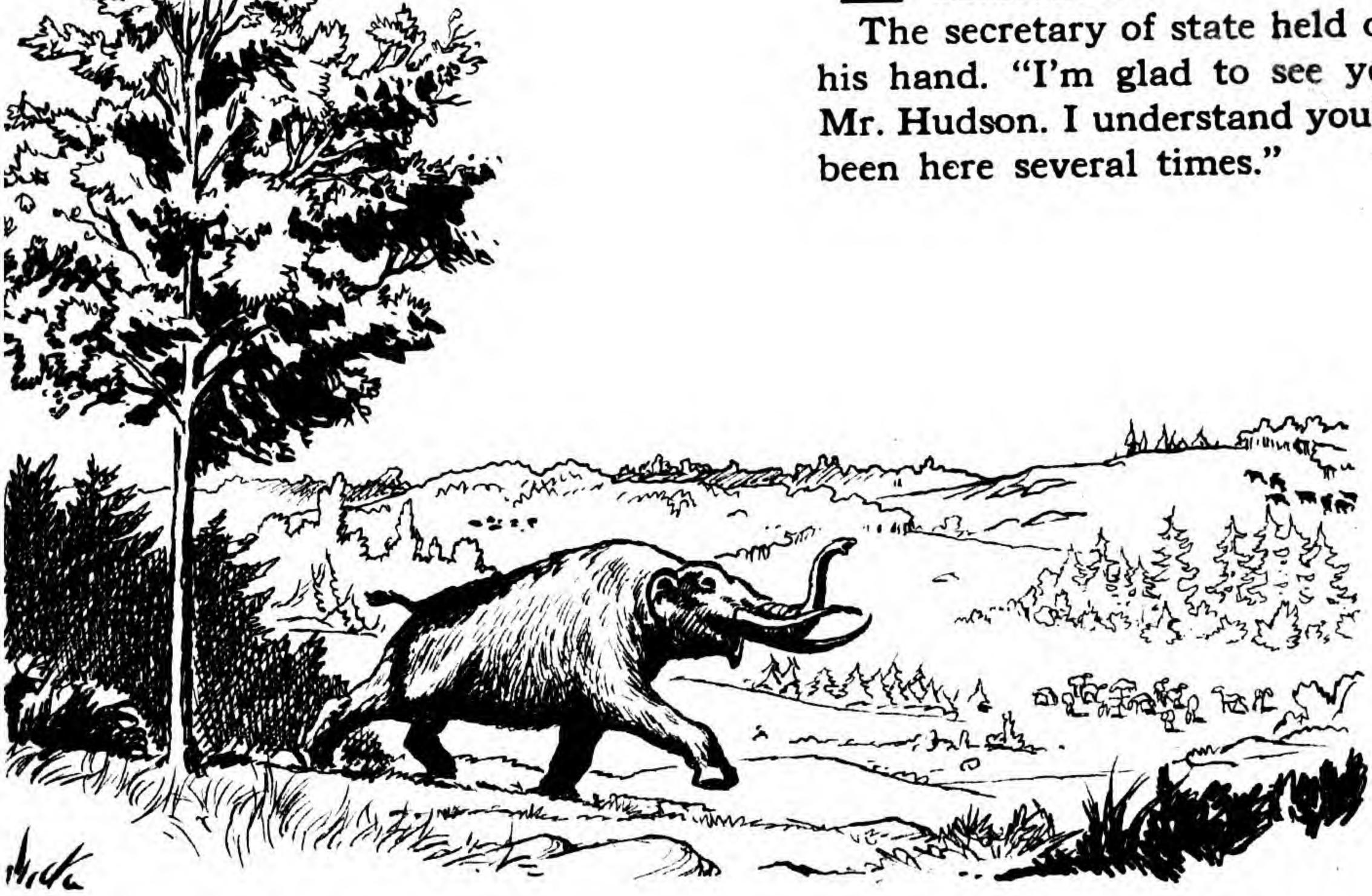
Illustrated by EMSH

Mastodon

What they wanted was routine—diplomatic recognition, a trade agreement and Point Four aid—for a nation that didn't exist!

THE chief of protocol said, "Mr. Hudson of—ah—Mastodonia."

The secretary of state held out his hand. "I'm glad to see you, Mr. Hudson. I understand you've been here several times."



"That's right," said Hudson. "I had a hard time making your people believe I was in earnest."

"And are you, Mr. Hudson?"

"Believe me, sir, I would not try to fool you."

"And this Mastodonia," said the secretary, reaching down to tap the document upon the desk. "You will pardon me, but I've never heard of it."

"It's a new nation," Hudson explained, "but quite legitimate. We have a constitution, a democratic form of government, duly elected officials and a code of laws. We are a free, peace-loving people and we are possessed of a vast amount of natural resources and—"

"Please tell me, sir," interrupted the secretary, "just where are you located?"

"Technically, you are our nearest neighbors."

"But that is ridiculous!" exploded Protocol.

"Not at all," insisted Hudson. "If you will give me a moment, Mr. Secretary, I have considerable evidence."

He brushed the fingers of Protocol off his sleeve and stepped forward to the desk, laying down the portfolio he carried.

"Go ahead, Mr. Hudson," said the secretary. "Why don't we all sit down and be comfortable while we talk this over?"

"You have my credentials, I see. Now here is a propos—"

"I have a document signed by a certain Wesley Adams."

"He's our first president," said Hudson. "Our George Washington, you might say."

"What is the purpose of this visit, Mr. Hudson?"

"We'd like to establish diplomatic relations. We think it would be to our mutual benefit. After all, we are a sister republic in perfect sympathy with your policies and aims. We'd like to negotiate trade agreements and we'd be grateful for some Point Four aid."

The secretary smiled. "Naturally. Who doesn't?"

"We're prepared to offer something in return," Hudson told him stiffly. "For one thing, we could offer sanctuary."

"Sanctuary!"

"I understand," said Hudson, "that in the present state of international tensions, a foolproof sanctuary is not something to be sneezed at."

The secretary turned stone cold. "I'm an extremely busy man."

Protocol took Hudson firmly by the arm. "Out you go."

GENERAL Leslie Bowers put in a call to State and got the secretary.

"I don't like to bother you, Herb," he said, "but there's

something I want to check. Maybe you can help me."

"Glad to help you if I can."

"There's a fellow hanging around out here at the Pentagon, trying to get in to see me. Said I was the only one he'd talk to, but you know how it is."

"I certainly do."

"Name of Huston or Hudson or something like that."

"He was here just an hour or so ago," said the secretary. "Crackpot sort of fellow."

"He's gone now?"

"Yes. I don't think he'll be back."

"Did he say where you could reach him?"

"No, I don't believe he did."

"How did he strike you? I mean what kind of impression did you get of him?"

"I told you. A crackpot."

"I suppose he is. He said something to one of the colonels that got me worrying. Can't pass up anything, you know—not in the Dirty Tricks Department. Even if it's crackpot, these days you got to have a look at it."

"He offered sanctuary," said the secretary indignantly. "Can you imagine that!"

"He's been making the rounds, I guess," the general said. "He was over at AEC. Told them some sort of tale about knowing where there were vast uranium deposits. It was the AEC that told me he was heading your way."

"We get them all the time. Usually we can ease them out. This Hudson was just a little better than the most of them. He got in to see me."

"He told the colonel something about having a plan that would enable us to establish secret bases anywhere we wished, even in the territory of potential enemies. I know it sounds crazy . . ."

"Forget it, Les."

"You're probably right," said the general, "but this idea sends me. Can you imagine the look on their Iron Curtain faces?"

THE scared little government clerk, darting conspiratorial glances all about him, brought the portfolio to the FBI.

"I found it in a bar down the street," he told the man who took him in tow. "Been going there for years. And I found this portfolio laying in the booth. I saw the man who must have left it there and I tried to find him later, but I couldn't."

"How do you know he left it there?"

"I just figured he did. He left the booth just as I came in and it was sort of dark in there and it took a minute to see this thing laying there. You see, I always take the same booth every day and Joe sees me come in and he

brings me the usual and—"

"You saw this man leave the booth you usually sit in?"

"That's right."

"Then you saw the portfolio."

"Yes, sir."

"You tried to find the man, thinking it must have been his."

"That's exactly what I did."

"But by the time you went to look for him, he had disappeared."

"That's the way it was."

"Now tell me—why did you bring it here? Why didn't you turn it in to the management so the man could come back and claim it?"

"Well, sir, it was like this. I had a drink or two and I was wondering all the time what was in that portfolio. So finally I took a peek and—"

"And what you saw decided you to bring it here to us."

"That's right. I saw—"

"Don't tell me what you saw. Give me your name and address and don't say anything about this. You understand that we're grateful to you for thinking of us, but we'd rather you said nothing."

"Mum's the word," the little clerk assured him, full of vast importance.

The FBI phoned Dr. Ambrose Amberly, Smithsonian expert on paleontology.

"We've got something, Doctor, that we'd like you to have a look at. A lot of movie film."

"I'll be most happy to. I'll come down as soon as I get clear. End of the week, perhaps?"

"This is very urgent, Doctor. Damnest thing you ever saw. Big, shaggy elephants and tigers with teeth down to their necks. There's a beaver the size of a bear."

"Fakes," said Amberly, disgusted. "Clever gadgets. Camera angles."

"That's what we thought first, but there are no gadgets, no camera angles. This is the real McCoy."

"I'm on my way," the paleontologist said, hanging up.

Snide item in smug, smart-aleck gossip column: Saucers are passé at the Pentagon. There's another mystery that's got the high brass very high.

II

PRESIDENT Wesley Adams and Secretary of State John Cooper sat glumly under a tree in the capital of Mastodonia and waited for the ambassador extraordinary to return.

"I tell you, Wes," said Cooper, who, under various pseudonyms, was also the secretaries of commerce, treasury and war, "this is a crazy thing we did. What if Chuck can't get back? They

might throw him in jail or something might happen to the time unit or the helicopter. We should have gone along."

"We had to stay," Adams said. "You know what would happen to this camp and our supplies if we weren't around here to guard them."

"The only thing that's given us any trouble is that old mastodon. If he comes around again, I'm going to take a skillet and bang him in the brisket."

"That isn't the only reason, either," said President Adams, "and you know it. We can't go deserting this nation now that we've created it. We have to keep possession. Just planting a flag and saying it's ours wouldn't be enough. We might be called upon for proof that we've established residence. Something like the old homestead laws, you know."

"We'll establish residence sure enough," growled Secretary Cooper, "if something happens to that time unit or the helicopter."

"You think they'll do it, Johnny?"

"Who do what?"

"The United States. Do you think they'll recognize us?"

"Not if they know who we are."

"That's what I'm afraid of."

"Chuck will talk them into it. He can talk the skin right off a cat."

"Sometimes I think we're going at this wrong. Sure, Chuck's got the long-range view and I suppose it's best. But maybe what we ought to do is grab a good, fast profit and get out of here. We could take in hunting parties at ten thousand a head or maybe we could lease it to a movie company."

"We can do all that and do it legally and with full protection," Cooper told him, "if we can get ourselves recognized as a sovereign nation. If we negotiate a mutual defense pact, no one would dare get hostile because we could squawk to Uncle Sam."

"All you say is true," Adams agreed, "but there are going to be questions. It isn't just a matter of walking into Washington and getting recognition. They'll want to know about us, such as our population. What if Chuck has to tell them it's a total of three persons?"

COOPER shook his head. "He wouldn't answer that way, Wes. He'd duck the question or give them some diplomatic double-talk. After all, how can we be *sure* there are only three of us? We took over the whole continent, remember."

"You know well enough, Johnny, there are no other humans back here in North America. The farthest back any scientist will place the migrations from Asia is

30,000 years. They haven't got here yet."

"Maybe we should have done it differently," mused Cooper. "Maybe we should have included the whole world in our proclamation, not just the continent. That way, we could claim quite a population."

"It wouldn't have held water. Even as it is, we went a little further than precedent allows. The old explorers usually laid claim to certain watersheds. They'd find a river and lay claim to all the territory drained by the river. They didn't go grabbing off whole continents."

"That's because they were never sure of exactly what they had," said Cooper. "We are. We have what you might call the advantage of hindsight."

He leaned back against the tree and stared across the land. It was a pretty place, he thought—the rolling ridges covered by vast grazing areas and small groves, the forest-covered, ten-mile river valley. And everywhere one looked, the grazing herds of mastodon, giant bison and wild horses, with the less gregarious fauna scattered hit and miss.

Old Buster, the troublesome mastodon, a lone bull which had been probably run out of a herd by a younger rival, stood at the edge of a grove a quarter-mile away. He had his head down and was curling and uncurling his trunk in an aimless sort of way while he teetered slowly in a lazy-crazy fashion by lifting first one foot and then another.

The old cuss was lonely, Cooper told himself. That was why he hung around like a homeless dog—except that he was too big and awkward to have much pet-appeal and, more than likely, his temper was unstable.

The afternoon sun was pleasantly warm and the air, it seemed to Cooper, was the freshest he had ever smelled. It was, altogether, a very pleasant place, an Indian-summer sort of land, ideal for a Sunday picnic or a camping trip.

THE breeze was just enough to float out from its flagstaff before the tent the national banner of Mastodonia—a red rampant mastodon upon a field of green ferns.

"You know, Johnny," said Adams, "there's one thing that worries me a lot. If we're going to base our claim on precedent, we may be way off base. The old explorers always claimed their discoveries for their nations or their king, never for themselves."

"The principle was entirely different," Cooper told him. "Nobody ever did anything for himself in those days. Everyone was always under someone else's pro-

tection. The explorers either were financed by their governments or were sponsored by them or operated under a royal charter or a patent. With us, it's different. Ours is a private enterprise. You dreamed up the time unit and built it. The three of us chipped in to buy the helicopter. We've paid all of our expenses out of our own pockets. We never got a dime from anyone. We never represented anyone. What we found is ours."

"I hope you're right," said Adams uneasily.

Old Buster had moved out from the grove and was shuffling warily toward the camp. Adams picked up the rifle that lay across his knees.

"Wait," said Cooper sharply. "Maybe he's just bluffing. It would be a shame to plaster him; he's such a nice old guy."

Adams half raised the rifle.

"I'll give him three steps more," he announced. "I've had enough of him."

Suddenly a roar burst out of the air just above their heads. The two leaped to their feet.

"It's Chuck!" Cooper yelled. "He's back!"

The helicopter made a half-turn of the camp and came rapidly to Earth.

Trumpeting with terror, Old Buster was a dwindling dot far down the grassy ridge.

III

THEY built the nightly fires circling the camp to keep out the animals.

"It'll be the death of me yet," said Adams wearily, "cutting all this wood."

"We have to get to work on that stockade," Cooper said. "We've fooled around too long. Some night, fire or no fire, a herd of mastodon will come busting in here and if they ever hit the helicopter, we'll be dead ducks. It wouldn't take more than just five seconds to turn us into Robinson Crusoes of the Pleistocene."

"Well, now that this recognition thing has petered out on us," said Adams, "maybe we can get down to business."

"Trouble is," Cooper answered, "we spent about the last of our money on the chain saw to cut this wood and on Chuck's trip to Washington. To build a stockade, we need a tractor. We'd kill ourselves if we tried to rassle that many logs bare-handed."

"Maybe we could catch some of those horses running around out there."

"Have you ever broken a horse?"

"No, that's one thing I never tried."

"Me, either. How about you, Chuck?"

"Not me," said the ex-ambas-

sador extraordinary bluntly.

Cooper squatted down beside the coals of the cooking fire and twirled the spit. Upon the spit were three grouse and half a dozen quail. The huge coffee pot was sending out a nose-tingling aroma. Biscuits were baking in the reflector.

"We've been here six weeks," he said, "and we're still living in a tent and cooking on an open fire. We better get busy and get something done."

"The stockade first," said Adams, "and that means a tractor."

"We could use the helicopter."

"Do you want to take the chance? That's our getaway. Once something happens to it . . ."

"I guess not," Cooper admitted, gulping.

"We could use some of that Point Four aid right now," commented Adams.

"They threw me out," said Hudson. "Everywhere I went, sooner or later they got around to throwing me out. They were real organized about it."

"Well, we tried," Adams said.

"And to top it off," added Hudson, "I had to go and lose all that film and now we'll have to waste our time taking more of it. Personally, I don't ever want to let another saber-tooth get that close to me while I hold the camera."

"You didn't have a thing to worry about," Adams objected. "Johnny was right there behind you with the gun."

"Yeah, with the muzzle about a foot from my head when he let go."

"I stopped him, didn't I?" demanded Cooper.

"With his head right in my lap."

"Maybe we won't have to take any more pictures," Adams suggested.

"We'll have to," Cooper said. "There are sportsmen up ahead who'd fork over ten thousand bucks easy for two weeks of hunting here. But before we could sell them on it, we'd have to show them movies. That scene with the saber-tooth would cinch it."

"If it didn't scare them off," Hudson pointed out. "The last few feet showed nothing but the inside of his throat."

EX-AMBASSADOR Hudson looked unhappy. "I don't like the whole setup. As soon as we bring someone in, the news is sure to leak. And once the word gets out, there'll be guys lying in ambush for us—maybe even nations—scheming to steal the know-how, legally or violently. That's what scares me the most about those films I lost. Someone will find them and they may guess what it's all about, but I'm hoping they either won't believe it or

can't manage to trace us."

"We could swear the hunting parties to secrecy," said Cooper.

"How could a sportsman keep still about the mounted head of a saber-tooth or a record piece of ivory? And the same thing would apply to anyone we approached. Some university could raise dough to send a team of scientists back here and a movie company would cough up plenty to use this place as a location for a caveman epic. But it wouldn't be worth a thing to either of them if they couldn't tell about it.

"Now if we could have gotten recognition as a nation, we'd have been all set. We could make our own laws and regulations and be able to enforce them. We could bring in settlers and establish trade. We could exploit our natural resources. It would all be legal and aboveboard. We could tell who we were and where we were and what we had to offer."

"We aren't licked yet," said Adams. "There's a lot that we can do. Those river hills are covered with ginseng. We can each dig a dozen pounds a day. There's good money in the root."

"Ginseng root," Cooper said, "is peanuts. We need *big* money."

"Or we could trap," offered Adams. "The place is alive with beaver."

"Have you taken a good look at those beaver? They're about the size of a St. Bernard."

"All the better. Think how much just one pelt would bring."

"No dealer would believe that it was beaver. He'd think you were trying to pull a fast one on him. And there are only a few states that allow beaver to be trapped. To sell the pelts—even if you could—you'd have to take out licenses in each of those states."

"Those mastodon carry a lot of ivory," said Cooper. "And if we wanted to go north, we'd find mammoths that would carry even more . . ."

"And get socked into the jug for ivory smuggling?"

They sat, all three of them, staring at the fire, not finding anything to say.

The moaning complaint of a giant hunting cat came from somewhere up the river.

IV

HUDSON lay in his sleeping bag, staring at the sky. It bothered him a lot. There was not one familiar constellation, not one star that he could name with any certainty. This juggling of the stars, he thought, emphasized more than anything else in this ancient land the vast gulf of years which lay between him and the Earth where he had been—or would be—born.

A hundred and fifty thousand years, Adams had said, give or take ten thousand. There just was no way to know. Later on, there might be. A measurement of the stars and a comparison with their positions in the twentieth century might be one way of doing it. But at the moment, any figure could be no more than a guess.

The time machine was not something that could be tested for calibration or performance. As a matter of fact, there *was* no way to test it. They had not been certain, he remembered, the first time they had used it, that it would really work. There had been no way to find out. When it worked, you knew it worked. And if it hadn't worked, there would have been no way of knowing beforehand that it wouldn't.

Adams had been sure, of course, but that had been because he had absolute reliance in the half-mathematical, half-philosophic concepts he had worked out—concepts that neither Hudson nor Cooper could come close to understanding.

That had always been the way it had been, even when they were kids, with Wes dreaming up the deals that he and Johnny carried out. Back in those days, too, they had used time travel in their play. Out in Johnny's back yard, they had rigged up a time machine out of a wonderful collection of salvaged junk—a wooden crate, an empty five-gallon paint pail, a battered coffee maker, a bunch of discarded copper tubing, a busted steering wheel and other odds and ends. In it, they had "traveled" back to Indian-before-the-white-man land and mammoth-land and dinosaur-land and the slaughter, he remembered, had been wonderfully appalling.

But, in reality, it had been much different. There was much more to it than gunning down the weird fauna that one found.

And they should have known there would be, for they had talked about it often.

He thought of the bull session back in university and the little, usually silent kid who sat quietly in the corner, a law-school student whose last name had been Pritchard.

And after sitting silently for some time, this Pritchard kid had spoken up: "If you guys ever do travel in time, you'll run up against more than you bargain for. I don't mean the climate or the terrain or the fauna, but the economics and the politics."

THEY all peered at him, Hudson remembered, and then gone on with their talk. And after a short while, the talk had turned to women, as it always did.

He wondered where that quiet man might be. Some day, Hudson told himself, I'll have to look him up and tell him he was right.

We did it wrong, he thought. There were so many other ways we might have done it, but we'd been so sure and greedy—greedy for the triumph and the glory—and now there was no easy way to collect.

On the verge of success, they could have sought out help, gone to some large industrial concern or an educational foundation or even to the government. Like historic explorers, they could have obtained subsidization and sponsorship. Then they would have had protection, funds to do a proper job and they need not have operated on their present shoestring—one beaten-up helicopter and one time unit. They could have had several and at least one standing by in the twentieth century as a rescue unit, should that be necessary.

But that would have meant a bargain, perhaps a very hard one, and sharing with someone who had contributed nothing but the money. And there was more than money in a thing like this—there were twenty years of dreams and a great idea and the dedication to that great idea— years of work and years of disappointment and an almost fanatical refusal to give up.

Even so, thought Hudson, they had figured well enough. There had been many chances to make blunders and they'd made relatively few. All they lacked, in the last analysis, was backing.

Take the helicopter, for example. It was the one satisfactory vehicle for time traveling. You had to get up in the air to clear whatever upheavals and subsidences there had been through geologic ages. The helicopter took you up and kept you clear and gave you a chance to pick a proper landing place. Travel without it and, granting you were lucky with land surfaces, you still might materialize in the heart of some great tree or end up in a swamp or the middle of a herd of startled, savage beasts. A plane would have done as well, but back in this world, you couldn't land a plane —or you couldn't be certain that you could. A helicopter, though, could land almost anywhere.

In the time-distance they had traveled, they almost certainly had been lucky, although one could not be entirely sure just how great a part of it was luck. Wes had felt that he had not been working as blindly as it sometimes might appear. He had calibrated the unit for jumps of 50,000 years. Finer calibration, he had said realistically, would have to wait for more developmental work.

USING the 50,000-year calibrations, they had figured it out. One jump (conceding that the calibration was correct) would have landed them at the end of the Wisconsin glacial period; two jumps, at its beginning. The third would set them down toward the end of the Sangamon Interglacial and apparently it had—give or take ten thousand years or so.

They had arrived at a time when the climate did not seem to vary greatly, either hot or cold. The flora was modern enough to give them a homelike feeling. The fauna, modern and Pleistocenic, overlapped. And the surface features were little altered from the twentieth century. The rivers ran along familiar paths, the hills and bluffs looked much the same. In this corner of the Earth, at least, 150,000 years had not changed things greatly.

Boyhood dreams, Hudson thought, were wondrous. It was not often that three men who had daydreamed in their youth could follow it out to its end. But they had and here they were.

Johnny was on watch, and it was Hudson's turn next, and he'd better get to sleep. He closed his eyes, then opened them again for another look at the unfamiliar stars. The east, he saw, was flushed with silver light. Soon the Moon would rise, which was good. A man could keep a better watch when the Moon was up.

He woke suddenly, snatched upright and into full awareness by the marrow-chilling clamor that slashed across the night. The very air seemed curdled by the savage racket and, for a moment, he sat numbed by it. Then, slowly, it seemed—his brain took the noise and separated it into two distinct but intermingled categories, the deadly screaming of a cat and the maddened trumpeting of a mastodon.

The Moon was up and the countryside was flooded by its light. Cooper, he saw, was out beyond the watchfires, standing there and watching, with his rifle ready. Adams was scrambling out of his sleeping bag, swearing softly to himself. The cooking fire had burned down to a bed of mottled coals, but the watchfires still were burning and the helicopter, parked within their circle, picked up the glint of flames.

"It's Buster," Adams told him angrily. "I'd know that bellowing of his anywhere. He's done nothing but parade up and down and bellow ever since we got here. And now he seems to gone out and found himself a saber-tooth."

Hudson zipped down his sleeping bag, grabbed up his rifle and jumped to his feet, following Adams in a silent rush to where Cooper stood.

Cooper motioned at them. "Don't break it up. You'll never see the like of it again."

Adams brought his rifle up.

Cooper knocked the barrel down.

"You fool!" he shouted. "You want them turning on us?"

TWO hundred yards away stood the mastodon and, on his back, the screeching saber-tooth. The great beast reared into the air and came down with a jolt, bucking to unseat the cat, flailing the air with his massive trunk. And as he bucked, the cat struck and struck again with his gleaming teeth, aiming for the spine.

Then the mastodon crashed head downward, as if to turn a somersault, rolled and was on his feet again, closer to them now than he had been before. The huge cat had sprung off.

For a moment, the two stood facing one another. Then the tiger charged, a flowing streak of motion in the moonlight. Buster wheeled away and the cat, leaping, hit his shoulder, clawed wildly and slid off. The mastodon whipped to the attack, tusks slashing, huge feet stamping. The cat, caught a glancing blow by one of the tusks, screamed and leaped up, to land in spread-eagle fashion upon Buster's head.

Maddened with pain and fright, blinded by the tiger's raking claws, the old mastodon ran—straight toward the camp. And as he ran, he grasped the cat in his trunk and tore him from his hold, lifted him high and threw him.

"Look out!" yelled Cooper and brought his rifle up and fired.

For an instant, Hudson saw it all as if it were a single scene, motionless, one frame snatched from a fantastic movie epic—the charging mastodon, with the tiger lifted and the sound track one great blast of bloodthirsty bedlam.

Then the scene dissolved in a blur of motion. He felt his rifle thud against his shoulder, knowing he had fired, but not hearing the explosion. And the mastodon was almost on top of him, bearing down like some mighty and remorseless engine of blind destruction.

He flung himself to one side and the giant brushed past him. Out of the tail of his eye, he saw the thrown saber-tooth crash to Earth within the circle of the watchfires.

He brought his rifle up again and caught the area behind Buster's ear within his sights. He pressed the trigger. The mastodon staggered, then regained his stride and went rushing on. He hit one of the watchfires dead center and went through it, scattering coals and burning brands.


EMSH

Then there was a thud and the screeching clang of metal.

"Oh, no!" shouted Hudson.

Rushing forward, they stopped inside the circle of the fires.

The helicopter lay tilted at a crazy angle. One of its rotor blades was crumpled. Half across it, as if he might have fallen as he tried to bull his mad way over it, lay the mastodon.

Something crawled across the ground toward them, its spitting, snarling head gaping in the firelight, its back broken, hind legs trailing.

Calmly, without a word, Adams put a bullet into the head of the saber-tooth.

V

GENERAL Leslie Bowers rose from his chair and paced up and down the room. He stopped to bang the conference table with a knotted fist.

"You can't do it," he bawled at them. "You can't kill the project. I *know* there's something to it. We can't give it up!"

"But it's been ten years, General," said the secretary of the army. "If they were coming back, they'd be here by now."

The general stopped his pacing, stiffened. Who did that little civilian squirt think he was, talking to the military in that tone of voice!

"We know how you feel about it, General," said the chairman of the joint chiefs of staff. "I think we all recognize how deeply you're involved. You've blamed yourself all these years and there is no need of it. After all, there may be nothing to it."

"Sir," said the general, "I *know* there's something to it. I thought so at the time, even when no one else did. And what we've turned up since serves to bear me out. Let's take a look at these three men of ours. We knew almost nothing of them at the time, but we know them now. I've traced out their lives from the time that they were born until they disappeared—and I might add that, on the chance it might be all a hoax, we've searched for them for years and we've found no trace at all.

"I've talked with those who knew them and I've studied their scholastic and military records. I've arrived at the conclusion that if any three men could do it, they were the ones who could. Adams was the brains and the other two were the ones who carried out the things that he dreamed up. Cooper was a bulldog sort of man who could keep them going and it would be Hudson who would figure out the angles.

"And they knew the angles, gentlemen. They had it all doped out.

"What Hudson tried here in Washington is substantial proof of that. But even back in school, they were thinking of those angles. I talked some years ago to a lawyer in New York, name of Pritchard. He told me that even back in university, they talked of the economic and political problems that they might face if they ever cracked what they were working at.

"Wesley Adams was one of our brightest young scientific men. His record at the university and his war work bears that out. After the war, there were at least a dozen jobs he could have had. But he wasn't interested. And I'll tell you why he wasn't. He had something bigger—something he wanted to work on. So he and these two others went off by themselves—"

"You think he was working on a temporal—" the army secretary cut in.

"He was working on a time machine," roared the general. "I don't know about this 'temporal' business. Just plain 'time machine' is good enough for me."

"Let's calm down, General," said the JCS chairman. "After all, there's no need to shout."

THE general nodded. "I'm sorry, sir. I get all worked up about this. I've spent the last ten years with it. As you say, I'm trying to make up for what I failed to do ten years ago. I should have talked to Hudson. I was busy, sure, but not that busy. It's an official state of mind that we're too busy to see anyone and I plead guilty on that score. And now that you're talking about closing the project—"

"It's costing us money," said the army secretary.

"And we have no direct evidence," pointed out the JCS chairman.

"I don't know what you want," snapped the general. "If there was any man alive who could crack time, that man was Wesley Adams. We found where he worked. We found the workshop and we talked to neighbors who said there was something funny going on and—"

"But then years, General!" the army secretary protested.

"Hudson came here, bringing us the greatest discovery in all history, and we kicked him out. After that, do you expect them to come crawling back to us?"

"You think they went to someone else?"

"They wouldn't do that. They know what the thing they have found would mean. They wouldn't sell us out."

"Hudson came with a preposterous proposition," said the man from the state department.

"They had to protect them-

selves!" yelled the general. "If you had discovered a virgin planet with its natural resources intact, what would you do about it? Come trotting down here and hand it over to a government that's too 'busy' to recognize—"

"General!"

"Yes, sir," apologized the general tiredly. "I wish you gentlemen could see my view of it, how it all fits together. First there were the films and we have the word of a dozen competent paleontologists that it's impossible to fake anything as perfect as those films. But even granting that they could be, there are certain differences that no one would ever think of faking, because no one ever knew. Who, as an example, would put lynx tassels on the ears of a saber-tooth? Who would know that young mastodon were black?

"And the location. I wonder if you've forgotten that we tracked down the location of Adams' workshop from those films alone. They gave us clues so positive that we didn't even hesitate—we drove straight to the old deserted farm where Adams and his friends had worked. Don't you see how it all fits together?"

"I presume," the man from the state department said nastily, "that you even have an explanation as to why they chose that particular location."

"YOU thought you had me there," said the general, "but I have an answer. A good one. The southwestern corner of Wisconsin is a geologic curiosity. It was missed by all the glaciations. Why, we do not know. Whatever the reason, the glaciers came down on both sides of it and far to the south of it and left it standing there, a little island in a sea of ice.

"And another thing: Except for a time in the Triassic, that same area of Wisconsin has always been dry land. That and a few other spots are the only areas in North America which have not, time and time again, been covered by water. I don't think it necessary to point out the comfort it would be to an experimental traveler in time to be certain that, in almost any era he might hit, he'd have dry land beneath him."

The economics expert spoke up: "We've given this matter a lot of study and, while we do not feel ourselves competent to rule upon the possibility or impossibility of time travel, there are some observations I should like, at some time, to make."

"Go ahead right now," said the JCS chairman.

"We see one objection to the entire matter. One of the reasons, naturally, that we had some interest in it is that, if true, it would

give us an entire new planet to exploit, perhaps more wisely than we've done in the past. But the thought occurs that any planet has only a certain grand total of natural resources. If we go into the past and exploit them, what effect will that have upon what is left of those resources for use in the present? Wouldn't we, in doing this, be robbing ourselves of our own heritage?"

"That contention," said the AEC chairman, "wouldn't hold true in every case. Quite the reverse, in fact. We know that there was, in some geologic ages in the past, a great deal more uranium than we have today. Go back far enough and you'd catch that uranium before it turned into lead. In southwestern Wisconsin, there is a lot of lead. Hudson told us he knew the location of vast uranium deposits and we thought he was a crackpot talking through his hat. If we'd known—let's be fair about this—if we had known and believed him about going back in time, we'd have snapped him up at once and all this would not have happened."

"It wouldn't hold true with forests, either," said the chairman of the JCS. "Or with pastures or with crops."

THE economics expert was slightly flushed. "There is another thing," he said. "If we go back in time and colonize the land we find there, what would happen when that—well, let's call it retroactive—when that retroactive civilization reaches the beginning of our historic period? What will result from that cultural collision? Will our history change? Is what has happened false? Is all—"

"That's all poppycock!" the general shouted. "That and this other talk about using up resources. Whatever we did in the past—or are about to do—has been done already. I've lain awake nights, mister, thinking about all these things and there is no answer, believe me, except the one I give you. The question which faces us here is an immediate one. Do we give all this up or do we keep on watching that Wisconsin farm, waiting for them to come back? Do we keep on trying to find, independently, the process or formula or method that Adams found for traveling in time?"

"We've had no luck in our research so far, General," said the quiet physicist who sat at the table's end. "If you were not so sure and if the evidence were not so convincing that it had been done by Adams, I'd say flatly that it is impossible. We have no approach which holds any hope at all. What we've done so far, you might best describe as flounder. But if Adams turned the

trick, it must be possible. There may be, as a matter of fact, more ways than one. We'd like to keep on trying."

"Not one word of blame has been put on you for your failure," the chairman told the physicist. "That you could do it seems to be more than can be humanly expected. If Adams did it—*if* he did, I say—it must have been simply that he blundered on an avenue of research no other man has thought of."

"You will recall," said the general, "that the research program, even from the first, was thought of strictly as a gamble. Our one hope was, and must remain, that they will return."

"It would have been so much simpler all around," the state department man said, "if Adams had patented his method."

The general raged at him. "And had it published, all neat and orderly, in the patent office records so that anyone who wanted it could look it up and have it?"

"We can be most sincerely thankful," said the chairman, "that he did not patent it."

VI

THE helicopter would never fly again, but the time unit was intact.

Which didn't mean that it would work.

They held a powwow at their camp site. It had been, they decided, simpler to move the camp than to remove the body of Old Buster. So they had shifted at dawn, leaving the old mastodon still sprawled across the helicopter.

In a day or two, they knew, the great bones would be cleanly picked by the carrion birds, the lesser cats, the wolves and foxes and the little skulkers.

Getting the time unit out of the helicopter had been quite a chore, but they finally had managed and now Adams sat with it cradled in his lap.

"The worst of it," he told them, "is that I can't test it. There's no way to. You turn it on and it works or it doesn't work. You can't know till you try."

"That's something we can't help," Cooper replied. "The problem, seems to me, is how we're going to use it without the whirlybird."

"We have to figure out some way to get up in the air," said Adams. "We don't want to take the chance of going up into the twentieth century and arriving there about six feet underground."

"Common sense says that we should be higher here than up ahead," Hudson pointed out. "These hills have stood here since Jurassic times. They probably were a good deal higher then and

have weathered down. That weathering still should be going on. So we should be higher here than in the twentieth century—not much, perhaps, but higher."

"Did anyone ever notice what the altimeter read?" asked Cooper.

"I don't believe I did," Adams admitted.

"It wouldn't tell you, anyhow," Hudson declared. "It would just give our height then and now—and we were moving, remember—and what about air pockets and relative atmosphere density and all the rest?"

COOPER looked as discouraged as Hudson felt.

"How does this sound?" asked Adams. "We'll build a platform twelve feet high. That certainly should be enough to clear us and yet small enough to stay within the range of the unit's force-field."

"And what if we're two feet higher here?" Hudson pointed out.

"A fall of fourteen feet wouldn't kill a man unless he's plain unlucky."

"It might break some bones."

"So it might break some bones. You want to stay here or take a chance on a broken leg?"

"All right, if you put it that way. A platform, you say. A platform out of what?"

"Timber. There's lot of it. We just go out and cut some logs."

"A twelve-foot log is heavy. And how are we going to get that big a log uphill?"

"We drag it."

"We try to, you mean."

"Maybe we could fix up a cart," said Adams, after thinking a moment.

"Out of what?" Cooper asked.

"Rollers, maybe. We could cut some and roll the logs up here."

"That would work on level ground," Hudson said. "It wouldn't work to roll a log uphill. It would get away from us. Someone might get killed."

"The logs would have to be longer than twelve feet, anyhow," Cooper put in. "You'd have to set them in a hole and that takes away some footage."

"Why not the tripod principle?" Hudson offered. "Fasten three logs at the top and raise them."

"That's a gin-pole, a primitive derrick. It'd still have to be longer than twelve feet. Fifteen, sixteen, maybe. And how are we going to hoist three sixteen-foot logs? We'd need a block and tackle."

"There's another thing," said Cooper. "Part of those logs might just be beyond the effective range of the force-field. Part of them would have to—*have to*, mind you—move in time and part

couldn't. That would set up a stress . . ."

"Another thing about it," added Hudson, "is that we'd travel with the logs. I don't want to come out in another time with a bunch of logs flying all around me."

"Cheer up," Adams told them. "Maybe the unit won't work, anyhow."

VII

THE general sat alone in his office and held his head between his hands. The fools, he thought, the goddam knuckle-headed fools! Why couldn't they see it as clearly as he did?

For fifteen years now, as head of Project Mastodon, he had lived with it night and day and he could see all the possibilities as clearly as if they had been actual fact. Not military possibilities alone, although as a military man, he naturally would think of those first.

The hidden bases, for example, located within the very strongholds of potential enemies—within, yet centuries removed in time. Many centuries removed and only seconds distant.

He could see it all: The materialization of the fleets; the swift, devastating blow, then the instantaneous retreat into the fastnesses of the past. Terrific destruction, but not a ship lost nor a man.

Except that if you had the bases, you need never strike the blow. If you had the bases and let the enemy know you had them, there would never be the provocation.

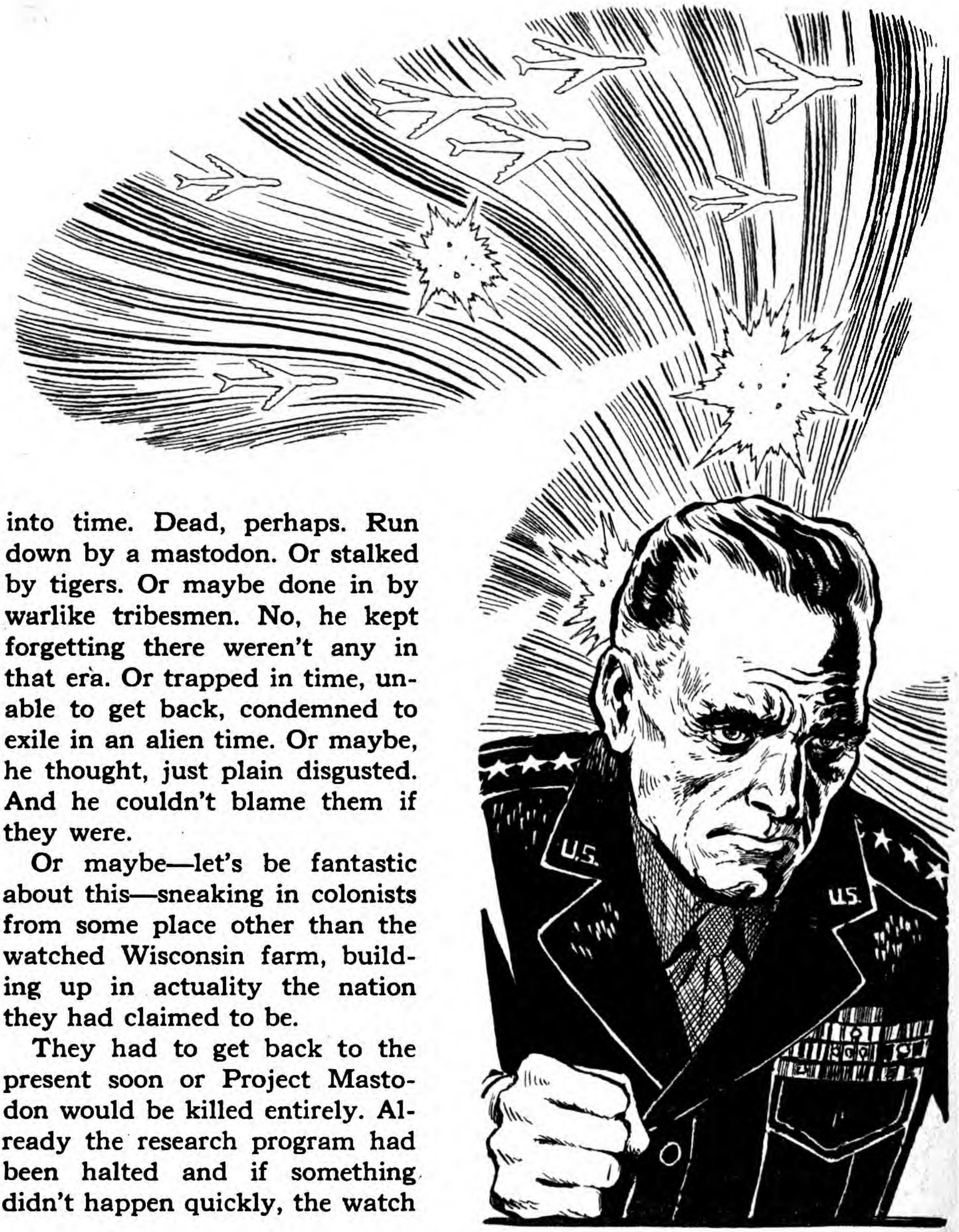
And on the home front, you'd have air-raid shelters that would be effective. You'd evacuate your population not in space, but time. You'd have the sure and absolute defense against any kind of bombing—fission, fusion, bacteriological or whatever else the labs had in stock.

And if the worst should come—which it never would with a setup like that—you'd have a place to which the entire nation could retreat, leaving to the enemy the empty, blasted cities and the lethally dusted countryside.

Sanctuary—that had been what Hudson had offered the then-secretary of state fifteen years ago—and the idiot had frozen up with the insult of it and had Hudson thrown out.

And if war did not come, think of the living space and the vast new opportunities—not the least of which would be the opportunity to achieve peaceful living in a virgin world, where the old hatreds would slough off and new concepts have a chance to grow.

He wondered where they were, those three who had gone back



into time. Dead, perhaps. Run down by a mastodon. Or stalked by tigers. Or maybe done in by warlike tribesmen. No, he kept forgetting there weren't any in that era. Or trapped in time, unable to get back, condemned to exile in an alien time. Or maybe, he thought, just plain disgusted. And he couldn't blame them if they were.

Or maybe—let's be fantastic about this—sneaking in colonists from some place other than the watched Wisconsin farm, building up in actuality the nation they had claimed to be.

They had to get back to the present soon or Project Mastodon would be killed entirely. Already the research program had been halted and if something didn't happen quickly, the watch

that was kept on the Wisconsin farm would be called off.

"And if they do that," said the general, "I know just what I'll do."

He got up and strode around the room.

"By God," he said, "I'll show 'em!"

VIII

IT had taken ten full days of back-breaking work to build the pyramid. They'd hauled the rocks from the creek bed half a mile away and had piled them, stone by rolling stone, to the height of a full twelve feet. It took a lot of rocks and a lot of patience, for as the pyramid went up, the base naturally kept broadening out.

But now all was finally ready.

Hudson sat before the burned-out campfire and held his blistered hands before him.

It should work, he thought, better than the logs—and less dangerous.

Grab a handful of sand. Some trickled back between your fingers, but most stayed in your grasp. That was the principle of the pyramid of stones. When—and if—the time machine should work, most of the rocks would go along.

Those that didn't go would simply trickle out and do no harm. There'd be no stress or strain to upset the working of the force-field.

And if the time unit didn't work?

Or if it did?

This was the end of the dream, thought Hudson, no matter how you looked at it.

For even if they did get back to the twentieth century, there would be no money and with the film lost and no other taken to replace it, they'd have no proof they had traveled back beyond the dawn of history—back almost to the dawn of Man.

Although how far you traveled would have no significance. An hour or a million years would be all the same; if you could span the hour, you could span the million years. And if you could go back the million years, it was within your power to go back to the first tick of eternity, the first stir of time across the face of emptiness and nothingness—back to that initial instant when nothing as yet had happened or been planned or thought, when all the vastness of the Universe was a new slate waiting the first chalk stroke of destiny.

Another helicopter would cost thirty thousand dollars—and they didn't even have the money to buy the tractor that they needed to build the stockade.

There was no way to borrow. You couldn't walk into a bank and say you wanted thirty thousand to take a trip back to the Old Stone Age.

You still could go to some industry or some university or the government and if you could persuade them you had something on the ball—why, then, they might put up the cash after cutting themselves in on just about all of the profits. And, naturally, they'd run the show because it was their money and all you had done was the sweating and the bleeding.

"There's one thing that still bothers me," said Cooper, breaking the silence. "We spent a lot of time picking our spot so we'd miss the barn and house and all the other buildings . . ."

"Don't tell me the windmill!" Hudson cried.

"No. I'm pretty sure we're clear of that. But the way I figure, we're right astraddle that barbed-wire fence at the south end of the orchard."

"If you want, we could move the pyramid over twenty feet or so."

Cooper groaned. "I'll take my chances with the fence." Adams got to his feet, the time unit tucked underneath his arm. "Come on, you guys. It's time to go."

They climbed the pyramid gingerly and stood unsteadily at its top.

Adams shifted the unit around, clasped it to his chest.

"Stand around close," he said, "and bend your knees a little. It may be quite a drop."

"Go ahead," said Cooper. "Press the button."

Adams pressed the button.

Nothing happened.

The unit didn't work.

IX

THE chief of Central Intelligence was white-lipped when he finished talking.

"You're sure of your information?" asked the President.

"Mr. President," said the CIA chief, "I've never been more sure of anything in my entire life."

The President looked at the other two who were in the room, a question in his eyes.

The JCS chairman said, "It checks, sir, with everything we know."

"But it's incredible!" the President said.

"They're afraid," said the CIA chief. "They lie awake nights. They've become convinced that we're on the verge of traveling in time. They've tried and failed, but they think we're near success. To their way of thinking, they've got to hit us now or never, because once we actually get time travel, they know their number's up."

"But we dropped Project Mastodon entirely almost three years ago. It's been all of ten years since we stopped the research. It was twenty-five years ago that Hudson—"

"That makes no difference, sir. They're convinced we dropped the project publicly, but went underground with it. That would be the kind of strategy they could understand."

The President picked up a pencil and doodled on a pad.

"Who was that old general," he asked, "the one who raised so much fuss when we dropped the project? I remember I was in the Senate then. He came around to see me."

"Bowers, sir," said the JCS chairman.

"That's right. What became of him?"

"Retired."

"Well, I guess it doesn't make any difference now." He doodled some more and finally said, "Gentlemen, it looks like this is it. How much time did you say we had?"

"Not more than ninety days, sir. Maybe as little as thirty."

The President looked up at the JCS chairman.

"We're as ready," said the chairman, "as we will ever be. We can handle them—I think. There will, of course, be some—"

"I know," said the President.

"Could we bluff?" asked the secretary of state, speaking quietly. "I know it wouldn't stick, but at least we might buy some time."

"You mean hint that we have time travel?"

The secretary nodded.

"It wouldn't work," said the CIA chief tiredly. "If we really had it, there'd be no question then. They'd become exceedingly well-mannered, even neighborly, if they were sure we had it."

"But we haven't got it," said the President gloomily.

X

THE two hunters trudged homeward late in the afternoon, with a deer slung from a pole they carried on their shoulders. Their breath hung visibly in the air as they walked along, for the frost had come and any day now, they knew, there would be snow.

"I'm worried about Wes," said Cooper, breathing heavily. "He's taking this too hard. We got to keep an eye on him."

"Let's take a rest," panted Hudson.

They halted and lowered the deer to the ground.

"He blames himself too much," said Cooper. He wiped his sweaty forehead. "There isn't any need to. All of us walked into this with our eyes wide open."

"He's kidding himself and he knows it, but it gives him something to go on. As long as he can keep busy with all his puttering around, he'll be all right."

"He isn't going to repair the time unit, Chuck."

"I know he isn't. And he knows it, too. He hasn't got the tools or the materials. Back in the workshop, he might have a chance, but here he hasn't."

"It's rough on him."

"It's rough on all of us."

"Yes, but we didn't get a brainstorm that marooned two old friends in this tail end of nowhere. And we can't make him swallow it when we say that it's okay, we don't mind at all."

"That's a lot to swallow, Johnny."

"What's going to happen to us, Chuck?"

"We've got ourselves a place to live and there's lots to eat. Save our ammo for the big game—a lot of eating for each bullet—and trap the smaller animals."

"I'm wondering what will happen when the flour and all the other stuff is gone. We don't have too much of it because we always figured we could bring in more."

"We'll live on meat," said Hudson. "We got bison by the million. The plains Indians lived on them alone. And in the spring, we'll find roots and in the summer berries. And in the fall, we'll harvest a half-dozen kinds of nuts."

"Some day our ammo will be gone, no matter how careful we are with it."

"Bows and arrows. Slingshots. Spears."

"There's a lot of beasts here I wouldn't want to stand up to with nothing but a spear."

"We won't stand up to them. We'll duck when we can and run when we can't duck. Without our guns, we're no lords of creation—not in this place. If we're going

to live, we'll have to recognize that fact."

"And if one of us gets sick or breaks a leg or—"

"We'll do the best we can. Nobody lives forever."

BUT they were talking around the thing that really bothered them, Hudson told himself—each of them afraid to speak the thought aloud.

They'd live, all right, so far as food, shelter and clothing were concerned. And they'd live most of the time in plenty, for this was a fat and open-handed land and a man could make an easy living.

But the big problem—the one they were afraid to talk about—was their emptiness of purpose. To live, they had to find some meaning in a world without society.

A man cast away on a desert isle could always live for hope, but here there was no hope. A Robinson Crusoe was separated from his fellow-humans by, at the most, a few thousand miles. Here they were separated by a hundred and fifty thousand years.

Wes Adams was the lucky one so far. Even playing his thousand-to-one shot, he still held tightly to a purpose, feeble as it might be—the hope that he could repair the time machine.

We don't need to watch him now, thought Hudson. The time we'll have to watch is when he is forced to admit he can't fix the machine.

And both Hudson and Cooper had been kept sane enough, for there had been the cabin to be built and the winter's supply of wood to cut and the hunting to be done.

But then there would come a time when all the chores were finished and there was nothing left to do.

"You ready to go?" asked Cooper.

"Sure. All rested now," said Hudson.

They hoisted the pole to their shoulders and started off again.

Hudson had lain awake nights thinking of it and all the thoughts had been dead ends.

One could write a natural history of the Pleistocene, complete with photographs and sketches, and it would be a pointless thing to do, because no future scientist would ever have a chance to read it.

Or they might labor to build a memorial, a vast pyramid, perhaps, which would carry a message forward across fifteen hundred centuries, snatching with bare hands at a semblance of immortality. But if they did, they would be working against the sure and certain knowledge that it all would come to naught, for they knew in advance that no

such pyramid existed in historic time.

Or they might set out to seek contemporary Man, hiking across four thousand miles of wilderness to Bering Strait and over into Asia. And having found contemporary Man cowering in his caves, they might be able to help him immeasurably along the road to his great inheritance. Except that they'd never make it and even if they did, contemporary Man undoubtedly would find some way to do them in and might eat them in the bargain.

They came out of the woods and there was the cabin, just a hundred yards away. It crouched against the hillside above the spring, with the sweep of grassland billowing beyond it to the slate-gray skyline. A trickle of smoke came up from the chimney and they saw the door was open.

"Wes oughtn't to leave it open that way," said Cooper. "No telling when a bear might decide to come visiting."

"Hey, Wes!" yelled Hudson.

But there was no sign of him.

Inside the cabin, a white sheet of paper lay on the table top. Hudson snatched it up and read it, with Cooper at his shoulder.

Dear guys—I don't want to get your hopes up again and have you disappointed. But I think I may have found the trouble. I'm going to try it out. If it doesn't work, I'll come back and burn this note and never say a word. But if you find the note, you'll know it worked and I'll be back to get you. Wes.

Hudson crumpled the note in his hand. "The crazy fool!"

"He's gone off his rocker," Cooper said. "He just thought . . ."

The same thought struck them both and they bolted for the door. At the corner of the cabin, they skidded to a halt and stood there, staring at the ridge above them.

The pyramid of rocks they'd built two months ago was gone!

XI

THE crash brought Gen. Leslie Bowers (ret.) up out of bed—about two feet out of bed—old muscles tense, white mustache bristling.

Even at his age, the general was a man of action. He flipped the covers back, swung his feet out to the floor and grabbed the shotgun leaning against the wall.

Muttering, he blundered out of the bedroom, marched across the dining room and charged into the kitchen. There, beside the door, he snapped on the switch that turned on the floodlights. He practically took the door off its hinges getting to the stoop and he stood there, bare feet gripping the planks, nightshirt billowing

in the wind, the shotgun poised and ready.

"What's going on out there?" he bellowed.

There was a tremendous pile of rocks resting where he'd parked his car. One crumpled fender and a drunken headlight peeped out of the rubble.

A man was clambering carefully down the jumbled stones, making a detour to dodge the battered fender.

The general pulled back the hammer of the gun and fought to control himself.

The man reached the bottom of the pile and turned around to face him. The general saw that he was hugging something tightly to his chest.

"Mister," the general told him, "your explanation better be a good one. That was a brand-new car. And this was the first time I was set for a night of sleep since my tooth quit aching."

The man just stood and looked at him.

"Who in thunder are you?" roared the general.

The man walked slowly forward. He stopped at the bottom of the stoop.

"My name is Wesley Adams," he said. "I'm—"

"Wesley Adams!" howled the general. "My God, man, where have you been all these years?"

"Well, I don't imagine you'll believe me, but the fact is . . ."

"We've been waiting for you. For twenty-five long years! Or, rather, *I've* been waiting for you. Those other idiots gave up. I've waited right here for you, Adams, for the last three years, ever since they called off the guard."

Adams gulped. "I'm sorry about the car. You see, it was this way . . ."

The general, he saw, was beaming at him fondly.

"I had faith in you," the general said.

HE waved the shotgun by way of invitation. "Come on in. I have a call to make."

Adams stumbled up the stairs.

"Move!" the general ordered, shivering. "On the double! You want me to catch my death of cold out here?"

Inside, he fumbled for the lights and turned them on. He laid the shotgun across the kitchen table and picked up the telephone.

"Give me the White House at Washington," he said. "Yes, I said the White House. . . The President? Naturally he's the one I want to talk to. . . Yes, it's all right. He won't mind my calling him."

"Sir," said Adams tentatively.

The general looked up. "What is it, Adams? Go ahead and say it."

"Did you say *twenty-five* years?"

"That's what I said. What were you doing all that time?"

Adams grasped the table and hung on. "But it wasn't . . ."

"Yes," said the general to the operator. "Yes, I'll wait."

He held his hand over the receiver and looked inquiringly at Adams. "I imagine you'll want the same terms as before."

"Terms?"

"Sure. Recognition. Point Four Aid. Defense pact."

"I suppose so," Adams said.

"You got these saps across the barrel," the general told him happily. "You can get anything you want. You rate it, too, after what you've done and the bonehead treatment you got—but especially for not selling out."

XII

THE night editor read the bulletin just off the teletype.

"Well, what do you know!" he said. "We just recognized Mastodonia."

He looked at the copy chief.

"Where the hell is Mastodonia?" he asked.

The copy chief shrugged. "Don't ask me. You're the brains in this joint."

"Well, let's get a map for the next edition," said the night editor.

XIII

TABBY, the saber-tooth, dabbed playfully at Cooper with his mighty paw.

Cooper kicked him in the ribs —an equally playful gesture.

Tabby snarled at him.

"Show your teeth at me, will you!" said Cooper. "Raised you from a kitten and that's the gratitude you show. Do it just once more and I'll belt you in the chops."

Tabby lay down blissfully and began to wash his face.

"Some day," warned Hudson, "that cat will miss a meal and that's the day you'll be it."

"Gentle as a dove," Cooper assured him. "Wouldn't hurt a fly."

"Well, one thing about it, nothing dares to bother us with that monstrosity around."

"Best watchdog there ever was. Got to have something to guard all this stuff we've got. When Wes gets back, we'll be millionaires. All those furs and ginseng and the ivory."

"*If* he gets back."

"He'll be back. Quit your worrying."

"But it's been five years," Hudson protested.

"He'll be back. Something happened, that's all. He's probably working on it right now. Could be that he messed up the time

setting when he repaired the unit or it might have been knocked out of kilter when Buster hit the helicopter. That would take a while to fix. I don't worry that he won't come back. What I can't figure out is why did he go and leave us?"

"I've told you," Hudson said. "He was afraid it wouldn't work."

"There wasn't any need to be scared of that. We never would have laughed at him."

"No. Of course we wouldn't."

"Then what *was* he scared of?" Cooper asked.

"If the unit failed and we knew it failed, Wes was afraid we'd try to make him see how hopeless and insane it was. And he knew we'd probably convince him and then all his hope would be gone. And he wanted to hang onto that, Johnny. He wanted to hang onto his hope even when there wasn't any left."

"That doesn't matter now," said Cooper. "What counts is that he'll come back. I can feel it in my bones."

And here's another case, thought Hudson, of hope begging to be allowed to go on living.

God, he thought, I wish I could be that blind!

"Wes is working on it right now," said Cooper confidently.

XIV

HE was. Not he alone, but a thousand others, working desperately, knowing that the time was short, working not alone for two men trapped in time, but for the peace they all had dreamed about—that the whole world had yearned for through the ages.

For to be of any use, it was imperative that they could zero in the time machines they meant to build as an artilleryman would zero in a battery of guns, that each time machine would take its occupants to the same instant of the past, that their operation would extend over the same period of time, to the exact second.

It was a problem of control and calibration—starting with a prototype that was calibrated, as its finest adjustment, for jumps of 50,000 years.

Project Mastodon was finally under way.

—CLIFFORD D. SIMAK

the candle lighter

By FREDERIK POHL

Jaffa had the damning facts about Mars. Now all he had to do was make them fit the truth!

THE Trusteeship Director fished out a pack of cigarettes and offered them to Jaffa Doane. "I heard your speech last night," he said. "Cigarette?"

"I don't smoke," said Jaffa Doane.

"It was a good speech." The Director lit his cigarette thoughtfully, flicked the match away. Doane waited with patience in his eyes—an expression that seemed very much out of place on the face of Jaffa Doane. But Doane had practiced patience

Illustrated by DICK FRANCIS

before the Director's "invitation" had reached him that morning. He knew it was coming; you can't tell blunt truths on a world hookup and not expect to make a stir.

The Director said, "I've checked your record, Doane. It's a good one. You have consistently fought for a lot of things that I happen to believe in myself. Naturally, I think you're off base this time, but I was with you on the Kaffirs, I was with you on the Ainus, I'll be with you again, I'm sure. In fact, if you look it up in the books of your Equality League, you'll find that I sent in my two dollars dues long ago." He peered at Doane under his eyebrows and chuckled. "Don't look so surprised."

"I can't help it," Doane said severely. "After what your administration has done to the Martians—"

"The Martians! Why, those—Never mind." He clamped the words down in his throat. "Just what," he demanded, "have we done to them?"

Doane leaned forward. "Turned them into savages! Exploited them, degraded them, reduced them to barbarism. Do you want the entire catalogue, sir? *I* know how the Mars Trusteeship has been run! The Administrators have made themselves gods, sir, *gods*! Their every whim is a commandment. *That's* what you've done!"

THE Director managed a smile, though his nostrils were flaring. "I said I heard your speech," he reminded Doane. "You had some suggestions to make, didn't you?"

"I did," said Doane proudly.

"And among them, you suggested that we remove Administrator Kellem and replace him with someone acceptable to the Equality League."

"It was. Kellem's handling of the General Mercantile incident was—"

"I know," the Director interrupted, and for the first time his smile relaxed. "I have here a radiogram from the Administration Comzone on Mars. Read it, Mr. Doane."

Doane took it suspiciously, but as he read, he began to beam.

MEDICAL CHECKUP SHOWS LOW-PRESSURE ASTHMA APPROACHING TERTIARY STAGE, INCURABLE AND DANGEROUS WITHOUT IMMEDIATE PERMANENT RETURN TO EARTH. REQUEST IMMEDIATE CLEARANCE FOR REPLACEMENT AND RETIREMENT.

KELLEM, MARS

Doane gloated: "He's retiring! Low-pressure asthma, my foot!

I thought the stink from General Mercantile would drive him out!"

The Director said in a level tone, "Kellem almost died last week, Doane."

"All right." Doane shrugged. "It makes no difference. In any case, I demand to be consulted in choosing his successor."

The Director eyed him. "You do, do you?" He pressed a button on his desk and said, "Ask Ne Mleek to come in." A sexy contralto replied, "Yes, sir."

The Director looked at Doane. "Ever seen a Martian?" he asked. "You take such an interest in them, I wonder if you've ever met one. Face-to-face, I mean; the pictures don't quite do them justice. No? Well, it's about time you did."

He stood up and gestured toward the door.

"Jaffa Doane," he said, "meet Ne Mleek."

Doane rose and turned to see who was coming in. He swallowed. "How do you do," he managed to say.

A SUPPRESSED sighing sound came from the thing that dragged itself through the doorway. Doane thought it formed words in a sort of airless whisper, the sound that might be made by a man with a slashed throat.

It went: "Gl'd t' n'w y—" The vowels were almost inaudible, the consonants as though they were being forced out against a gag. It was English, all right; you could make it out if you tried.

But if the thing's words were understandable, its expression was not. As the Director had said, you had to meet a Martian in the flesh: photos did not give more than a hint. On the squashed, whitely translucent face was what Doane thought a grin of savage glee, while the huge dull eyes held inexpressible sorrow. Neither interpretation, Doane told himself, meant much; that was anthrophomorphic thinking, and dangerous. But those looks took a little getting used to, all the same.

"Don't try to shake hands with him, Mr. Doane," said the Director. "He hasn't any."

It was true. Four supple, articulated tentacles waved around the Martian's midsection, but there were no hands or arms. The pear-shaped body was supported on stubby little legs which had neither knee nor ankle, as far as Jaffa Doane could see.

The Director was saying, "Ne Mleek is the Martian legate here in Washington and, like Kellem, the strain of an alien environment has hurt his health. He'll be going back to Mars on your

ship, Doane, and you'll be working with him."

"*Working* with him?" Doane gasped.

The Director allowed himself a look of surprise. "Haven't you figured it out yet, Doane? Since we must replace Kellem anyhow, we have decided to grant the Equality League's request. We are picking a man for the post that the League is certain to approve—because he is the president of it. I mean you, Mr. Doane."

"Me? *Me*? But I've never been on Mars!"

"In eighteen days," said the Director, "you will no longer be able to make that statement. That is, unless you refuse the appointment."

Jaffa Doane stood up and there was corrosive anger in his voice. "You'd like that, wouldn't you? You want me to turn it down, so you can tell the news services what a lot of hot air the president of the Equality League really is. Well, I can recognize a shoddy little political trick when I see one. You hand me a political hot potato, throw me in on a job that your fat-cats have finally messed up to the point where there are riots and investigations. If things go wrong, I'm the goat and that shuts up the Equality League. If things go right, your administration gets the credit."

"I take it you refuse," said the Director.

"No, sir! I don't refuse! It's a cheap trick—and I'll make you wish you'd never thought of it. I accept!"

He looked over his shoulder at the Martian who had become, in the space of a heartbeat, one of his charges. Jaffa Doane couldn't help wincing a little—they *did* look so much like ragged corpses!

But he said, "Come along, Ne Mleek. We're going to your home."

FOR more than a million members of the Equality League, Jaffa Doane was a severe and shining leader; his words were trumpet calls and his surging drive for justice was a bright flame. One or two of the members, however, took a more personal view of their president, among them a young lady whose name was Ruth-Ann Wharton. On the books, she was listed as Mr. Doane's personal secretary, but it had been several months now since she had first begun to contemplate a promotion for herself.

It had occurred to her that the eighteen-day flight to Mars on the shuttle rocket might provide the time and leisure for Jaffa Doane to notice just what a pearl he had as a secretary. But it had been a disappointing voyage;

Doane had kept to his stateroom most of the way.

A hatful of hours out of Marsport, Ruth-Ann was banging on her boss's stateroom door. "Jaffa," she called plaintively, and not for the first time, "Ne Mleek and another Martian are waiting for you. *Please* hurry."

Doane's low, controlled voice said, "I'll be there in a moment, Miss Wharton."

She scowled at the door. "I'll give you exactly one minute." But she didn't give him that much. She hammered again. "Jaffa, they're *waiting*."

Pause. Then the calm, relaxed voice. "Yes, of course. One moment."

Ruth-Ann stamped her foot. "Oh, darn you!" she said and did what she had wanted to do in the first place. She turned the knob and walked in. "They've been waiting half an hour and Ne Mleek says it's very important."

The room was in semi-darkness, lit only by the light from the corridor outside. From the rumpled heap of bedclothing, Jaffa Doane's voice said placidly, "I'm aware of that, Miss Wharton."

Her hands found the light switch. The bedclothing erupted and Jaffa Doane sat up, leaning on an elbow, blinking at her.

"What?" he croaked blearily. "Say, haven't I asked you to call me only from the outside?"

"You have," she said hotly, flinging back the ray-screen on the port. The tempered glass was treated to filter out most of the glare, but the direct sunlight lit up the little room like a movie set.

"Get *up*," she ordered. "If you're not outside and fully dressed in five minutes, I'm coming back and I'll dress you myself. Anyway, Jaffa, it looks as if it really is important. Ne Mleek is sighing and talking about your duty to your job. And the other Martian—well, it's hard to tell, everything considered, but he looks sick."

"Sick?" Jaffa Doane yawned and scratched. "Sick how?"

Ruth-Ann shook her head. "Come on out and see for yourself."

LOOKING hazily at his face in the mirror of the tiny washroom as he shaved, Jaffa Doane decided that Ruth-Ann, after all, was right. He did have a tendency to be—not difficult, exactly, not grumpy or nasty, but a little hard to wake up in the mornings. And besides, this was an important day. He was about to meet his charges. He wiped off the depilatory and stubble and stood erect, eyes burning into his own reflection in the mirror.

The sound of his stateroom door made him jump. "I'm coming right out!" he yelled.

In the room that had been fitted out as his office for the duration of the trip—and which he had hardly set foot in—Ne Mleek and Ruth-Ann were waiting. With them was another Martian and, looking at him, Jaffa Doane knew what the girl had meant when she said there was something wrong. A strapping young adult Martian, with a life expectancy of hundreds of years, somewhat resembles a wilting fungus; but this one looked rotten.

"Good morning, Ne Mleek," Jaffa Doane said courteously. "What can I do for you?"

The Martian's wheezy voice was somewhat easier to understand in the spaceship's half-and-half atmosphere — pressure an even eight pounds to the square inch, composition largely helium — than it had been when he was laboring to force his voice into the dense Earth air. "Indeed you can, honored sir. Gadian Pluur has the sickness and wishes Your Honor to cure him in the way that is known."

Jaffa Doane's eyebrows went up. "Cure him? You mean you want me to call a doctor?"

"Ah, no," whispered the Martian. "Your Honor will cure him yourself, surely."

Ruth-Ann was signaling. "You don't know what he wants, do you?" she said in a low tone.

"Good heavens, no."

SHE nodded smugly. "He wants you to touch this other one. That's all, just touch him."

"*Touch* him?" Doane stared at the Martian. "Ne Mleek, are you out of your mind?"

"Not so," the Martian whispered indignantly, the mad face working. "It is our custom, as is known. The Administrator Kellem and the Admiral Rosenman who was his assistant have always healed those ill of the sickness."

"Barbarous," marveled Jaffa Doane, forgetting to be angry. "And you, an intelligent man—an intelligent Martian like you, you believe in this?"

"There is nothing to believe or disbelieve," sighed Ne Mleek, his tentacles agitated, the pale eyes desolate. "It is our custom since the first of your honored administrators came."

Doane shook his head wonderingly.

"Touch him," Ruth-Ann advised.

"But—"

"Go ahead, touch him!"

Doane frowned. "Miss Wharton, this is a matter of principle. I am responsible not only to the Trusteeship Director, but to the

League, and I certainly couldn't justify—"

"*Touch him*!" The girl's face was set.

Doane was about to reply, but the ship gave a gentle course-correcting lurch and everyone in the little room staggered slightly —everyone but the sick Martian, Gadian Pluur, who staggered halfway across the room and brushed against Doane's fingers.

Jaffa Doane jerked back his hand. It had been a curious sensation, almost like an electric shock, but not localized—he could feel a tiny tingle up his backbone and at the base of his skull.

"Thanks to Your Honor," whispered Ne Mleek.

And the two Martians slipped slowly out, leaving Jaffa Doane staring frustratedly after them.

"BUT I have a speech all ready," Doane objected reasonably. "It's not just a lot of glowing promises and empty words, but facts. It tells how I am going to put a stop to—" he hesitated over the word— "the indiscretions of the previous Administrators."

Admiral Rosenman said cheerfully, "Fine." He was a chunky man with a big head of curly white hair. And he wore the severe uniform as though he had been born with it on. "But you can't get out of the Conjunction Offering."

"That's nothing short of murder! And my speech—"

"It's merely an execution, Mr. Doane. The Martian has had his trial and he has been convicted. It's up to you."

"But I'm not a hangman!"

"You're the Earth Administrator on Mars and one of your duties is carrying out the decisions of the Martian courts."

Doane glowered. "What's he convicted of?" he demanded suspiciously.

"What's the difference? Under the Martian laws, it's a crime punishable by death. They call it bad thinking."

"Bad thinking." Doane shook his head and walked over to the window of the Ad-Building office that was now his. The orange sandscape, dotted with smoke-trees, hurt his eyes; it was the Martian idea of a formal park, in the heart of the little city of Marsport, and it was a great honor to have one's office looking out over it. Or so the Martians thought.

They also thought it was an honor to be the executioner in what seemed to have some of the aspects of a ritual murder.

"I can't even see the conjunction of the moons," Doane said peevishly.

"The Martians can. Both

moons are perfectly visible to them."

"And this Conjunction Offering is traditional? What did they do back forty or fifty years ago, before the first Earthmen got here?"

Admiral Rosenman shrugged and glanced at the clock. "You ought to be getting ready," he said. "Am I dismissed?"

"You're dismissed," Doane said ungraciously and frowned at the Admiral's back as he left, using the weaving, flat-footed Mars walk that Doane had not yet mastered.

He sat down at his desk, carefully allowing for the light gravitation—and misjudged it, as he had six times before, and bumped his shin against the desk, as he had six times before.

RUTH-ANN Wharton said sympathetically, "It takes a little getting used to. Do you want me to come to the Conjunction Offering with you?"

"No!"

"There's no need to take my skin off."

He said stiffly, "I am sorry, Miss Wharton. Perhaps I'm a little upset."

"I understand, Jaffa."

"It didn't seem like this back on Earth," he said morosely, staring out at the smoke-trees. "You haven't heard the worst of it, Miss Wharton. Not only do I have to slit some poor devil's throat this evening—not only am I expected to perform the laying on of hands like somebody from the Dark Ages—but look at this!" He turned to his desk and picked up a thick sheaf of papers. "Duties for the Earth Administrator —*me*! The most ridiculous mass of superstitious nonsense I ever saw. If this is the way Kellem kept the Martians down, I can understand why there were riots at the General Mercantile base."

"At Niobe? But those were Earthmen involved in the brawl, Jaffa, not Martians."

"How do you know?" he asked pugnaciously. "Because Kellem's publicity men said so? All we know for sure is that there was trouble. There's *bound* to be trouble when you try to keep an intelligent, civilized race like Ne Mleek's down with barbarous tricks like these."

He glanced at the list and flinched. "Well, there's an end to it," he said grimly. "Kellem's gone and I'm here now. I'll be at the Conjunction Ceremony tonight, all right, and I'll start things rolling right then and there. You'll see! I'm telling you, Miss Wharton, Mars is going to —what's the matter?" he demanded irritably. "You look like you've got a question."

The girl nodded emphatically.

"I have. Why do you call me Miss Wharton instead of Ruth-Ann?"

THE Conjunction Offering was to take place in what the Martians had named the Park of Sparse Beauty.

"It's sparse enough," Jaffa Doane said from the rostrum, watching the Martians gather before him. "But is it beautiful enough?"

Admiral Rosenman asked sourly, "Are you ready for the ceremony?"

"Oh, quite ready," said Jaffa Doane. He started to hum to himself with a satisfied air, but you do not hum with oxygen plugs in your nostrils. He coughed and choked, and looked at the Admiral suspiciously. But the Admiral wasn't laughing.

The Admiral didn't think he had very much to laugh about. He had been on duty on Mars for seven years, surviving five Administrators, only one of whom had completed his three-year term. He had formed certain conclusions about the Martians and one of them was that they weren't too likely to get along well with the likes of Jaffa Doane . . .

It was dark and the Martians carried torches — not flaming brands, for flames do not thrive in Mars' thin atmosphere, but glowing balls of punk from the little bushes that grew wild in the wide reaches between settlements. The scene was hardly brightly illuminated: Martian eyes were not human eyes, though, and to them, Doane, realized, it might have been bright as day.

He looked fruitlessly at the spot in the sky where the two moons were supposed to be in conjunction with a particular star. One moon was visible, the other not. The star might or might not be visible—with all the stars in the Martian sky, one more or less made very little difference. But to the Martians, of course, .with their very much more acute vision, both moons were as visible as Luna from Earth and each star of the tens of thousands was an individual in its own right.

JAFFA Doane sighed. It was hard remembering all the differences between Martians and Earthmen—and trying to remember, at the same time, the diamond-clear principles of the Equality League, which said that the differences were as nothing . . .

There was no sound of trumpets, no burst of prompted applause from the idly drifting audience, but all of a sudden the ceremony seemed to have begun.

Ne Mleek appeared on the high platform where the Earth party was standing.

"In three of your minutes and eleven seconds, as is known to Your Honor," he said, "the conjunction will occur. This is he who is to die." He stepped aside to reveal another Martian, who gestured courteously with his tentacles.

"This is Fnihi Bel."

The condemned Martian said politely, "It is an honor to meet Your Honor. I am most sorry for the circumstances."

Doane looked embarrassedly at Ruth-Ann and the Admiral. He had had no lessons in how Jack Ketch greeted his clients; there was no precedent in his experience with the Equality League to guide him in the proper conduct of the maul-man meeting the steer at the top of the slippery chute.

But the Martian was tactful. He said, "Since I shall not have the power afterward, let me now thank Your Honor for the greatest of favors."

"For k i l l i n g you?" Doane blurted, scandalized. He made a face expressing his mood about the enforced subjection of the Martians; it was wasted on the Martians who expressed their feelings with formalized gestures of the tentacles, but not on Admiral Rosenman, who licked his lips and started to speak.

But not soon enough. "Fnihi Bel," Doane said compassionately, "under the authority vested in me as Administrator, I grant a stay of execution pending review of your case. You shall not die tonight."

ADMIRAL Rosenman swore and looked helplessly at Ruth-Ann. "If the crazy idiot had only talked it over first! No, not him! He made up his mind ten years before he ever saw a Martian and nothing's going to change it, especially facts!"

"What facts?" asked Ruth-Ann hotly. "You never told him anything."

"It's all in the files."

"Which he hasn't had a chance to look at. Honestly, Admiral, you're unreasonable." Ruth-Ann looked fretfully out the window. It was nearly daybreak; the sharp Martian dawn had popped into light over the horizon minutes before. "Do you suppose he's all right?"

The Admiral growled and flipped the switch on the intercom. "Any word?"

The uniformed man whose face appeared in the screen said, "Not yet, sir. The Administrator was seen about an hour ago near the Shacks. A detail has gone to search the area, but they haven't reported in yet."

"All right," the Admiral grumbled, clicking off.

"What are the Shacks?" Ruth-Ann wanted to know.

"Abandoned part of town. The Martians gave it up years ago. Nobody lives there now. Unpleasant place. Serves him right, the—"

"Watch yourself!" Ruth-Ann warned. "He's your boss!"

The Admiral glowered at her, but stopped. He yawned and stretched. "Not used to staying up all night any more," he said. "Kind of takes it out of me, but— Go ahead!" he snapped as the intercom called his name.

"Administrator D o a n e has been located by the search party, sir," said the officer. "Any orders?"

"Hold him there," roared the Admiral. "And get a car in front of the door in thirty seconds— I'm going to meet him!"

He clicked off the switch as Ruth-Ann corrected, "*We're* going to meet him, Admiral! If that big stuffed-shirt thinks he can scare me out of my wits and stir up every Martian from here to—"

"Hey, wait a minute!" the Admiral protested. "I thought you wouldn't let me call him names!"

"That's you," Ruth-Ann said shortly. "The rules are different for *me*. Come on, Admiral. What are you waiting for?"

THEY found Earth Administrator Jaffa Doane sitting on the ramp before an abandoned and decrepit Martian dwelling, staring into space. Admiral Rosenman dismissed the detail and helped the Administrator into the pressurized car. Doane's attention was elsewhere. Rosenman had to remind him even to take the oxygen plugs out of his nostrils.

"Thanks," said Doane absently.

And, after a pause, "I messed it up, didn't I?"

"You did," the Admiral told him. "You messed it up enough to put forty-eight Martians in the hospital—the *Earth* hospital."

Doane blinked.

"For physical injuries," the Admiral explained. "The Martians don't ordinarily hospitalize for that; a couple of hours of what they call good thinking and they can patch almost anything that's wrong with themselves. But these were pretty well beat up, mostly from running into moving vehicles, and I don't think there's a Martian within fifty miles that's capable of good thinking right now."

Jaffa Doane shook his head. "I don't get it," he complained. "All I did was try to save a man's life. Maybe I was wrong—I don't know. But how could it make so

much trouble? Rioting like crazy people. Getting themselves run over—and all because of a thing like that. I could understand it if they were ignorant natives, only they're not ignorant; they have a civilization of their own. How can these silly customs mean so much to them?"

The Admiral exploded, "Don't you understand yet? It is not just a silly custom! They were crazy, all right, but not because you violated a silly tabu—*because you did the thing that was bound to drive them insane.* You pushed them across the brink. They were sick. Infected by *you.*"

"But—"

"Don't argue with me! Sickness is not only of the body; even an Earthman can have mental illnesses, too. And Martians have no other kind. Shock them and they get sick. When they're sick, they need to be healed. If you break a leg, you splint it; if a Martian's mind is injured, it needs to be splinted with a stronger, stabler mind.

"Think back to the ship, Doane! When Ne Mleek begged you to touch the other Martian, did you think it was only a primitive custom? It was not. It was splinting and healing. When you made contact with him, his mind was braced against yours and you were the one who helped him grow well."

DOANE swallowed. "All right," he said reasonably. "Granted. But that's one thing and murder is another. What about the one I was supposed to kill?"

"The same principle, Doane. Even a Martian doesn't live forever, and when he is too sick to be cured, he has to die. The only way a Martian *can* die is by being physically destroyed. He can't kill himself. No Martian can. He can't be killed by another Martian—the shock would destroy *him.* So you're elected, Doane—the strongest, stablest being on Mars—the Earth Administrator."

Doane protested, "But what about the time before the Earthmen were here? How did they manage?"

Rosenman shrugged. "They didn't have Earthmen to do the dirty work, so they used Martians, of course."

"But you said—"

"I know what I said. Take a look around you, Doane." He gestured out the window at the rickety, abandoned buildings called the Shacks.

Compared with the clean, functional lines of the rest of the Martian architecture, the Shacks were a hideous blot. They leaned and they staggered. They were put together at random distances out of random materials. They looked unfit for even human hab-

itation, much less Martian.

"This is where they lived, the Outcasts," Rosenman said. "The strongest and healthiest of every generation, selected by rigorous tests and segregated into a caste of Healers. It was an honor to be a Healer, Doane—the greatest, most tragic honor that a Martian could attain. Read the Martian literature. It has noble stories in it, the Healers who sacrificed themselves for others. They were untouchables. There were a couple of hundred of them all the time, right here in the Shacks, injured mentally every time they had to put an incurable out of his misery, until they were beyond repair and had to be destroyed after a few years of agonizing service."

"And when we came, we became the untouchables?"

Rosenman hesitated. "Well, not exactly," he said, a little less roughly. "We took over the functions of the Healers to some extent, yes. After all, we Earthmen aren't as sensitive; and just for that reason, we're more stable. But, of course, even we crack up when the pressure is too great. Suppose the picture was different, Doane; suppose it was the Martians who were stronger and stabler, and suppose they came to Earth and showed us a way of emptying our asylums.

"We use psychiatrists because they're all we have—all the Martians had were the Healers. But the Healers weren't altogether satisfactory, as you can see, because it's an expensive cure that merely passes the disease on to someone else. Our psychiatrists aren't as effective as they should be, either—they're human, too; they have their own problems, which seriously interfere with and become intermingled with those of their patients.

"If the Martians had come to us with a real cure, not the half-cure that psychiatrists are capable of, we'd be stupid to go on using inadequate therapy. And the Martians aren't stupid. In fact, *that's* the mistake you and your Equality League made."

THE Administrator flared, "That's enough, Rosenman! The Equality League never—"

"Wait a minute! Admit it, Doane—you came here all full of red-hot ideas about how the Earth masters should be kind to their Martian slaves. No, don't argue; that's how it looked to you. Think it over. But the Martians aren't slaves, you see. In many ways, they're more cultured and smarter and a lot more sensitive than you and I. In some ways, in fact, they remind me of my grandfather."

"Your *what*?" Doane gasped, baffled.

"My grandfather. He was a very religious man," the Admiral explained reminiscently. "Every Friday night, we'd have the candles for the Sabbath, and —well, I don't know how familiar you are with the ritual, but on the Sabbath, the truly orthodox aren't allowed to work from sundown to sundown. Not even lighting the candles. So my grandfather used to hire an Irish kid from the neighborhood to be our candle lighter—a *shabbas goy*, he called him.

"Marty Madden, the boy's name was. Marty wasn't any better than we were or any worse—I don't think my grandfather ever thought that. But he was, in that one way, *different*; he could do something for us that we weren't allowed to do for ourselves. So, naturally, he did it. Just as you and I, Doane, do things for the Martians that they can't do for themselves."

The Admiral started the car for the trip back.

"I used to know Marty pretty well," he said. "We went to the same school during the week. In a way, I was sorry for him—he missed all the fun of the feasts and so on. In another way, I envied him, because he could do things I couldn't. But I never thought that so many years later, forty million miles from Mosholu Parkway, I'd be taking his job away from him . . ."

They rode back to the Administration Building in silence for most of the way, while Jaffa Doane digested some of the most ill-tasting realizations of his career.

As the building came into sight, he shook himself and sat up.

"All right," he said humbly, "I'll start all over. Make believe I landed this morning. Where do I start?"

ROSENMAN smiled and leaned over to pat his shoulder. "You'll do," he promised. "Where you start is in the clinic. You'll find about fifty Martians with some degree of shock, needing the healing touch of a sound mind—like yours. It won't be too bad. You'll have a headache afterward, but you can take a minor discomfort like that, can't you?"

"Gladly!" Doane said. "That's the least I can do. I want to apologize to both of you. You, too, Ruth-Ann. I've been about as big a self-centered, wrong-headed—"

She cut him off. "Oh, don't get all wound up. You're a bit of a phony, heaven knows—" she ignored the strangled noise he made—"but there are worse. Deep down inside, you're quite a guy. You wouldn't be as much of a man as you are if you didn't have a little ham in you, and a

touch of pig-headedness, too. I've given the matter a lot of thought, you see."

Rosenman grinned at Doane's expression. "She's right," he agreed. "Between us, we'll get you straightened out, so don't worry about it. Two more years here ought to do it. Basically, your ideas are right—the Martians ought to learn to get by on their own feet. You can start finding out how they can do it. It'll be good for you. When the two years of your term are up, you'll go home with a better, more human understanding of what's what, ready to settle down to a normal, productive existence on Earth with your wife and family."

Doane yelped, "Hold on there! I haven't *got* a wife, much less a family!"

Ruth-Ann patted his arm reassuringly. "You're not home yet," she said.

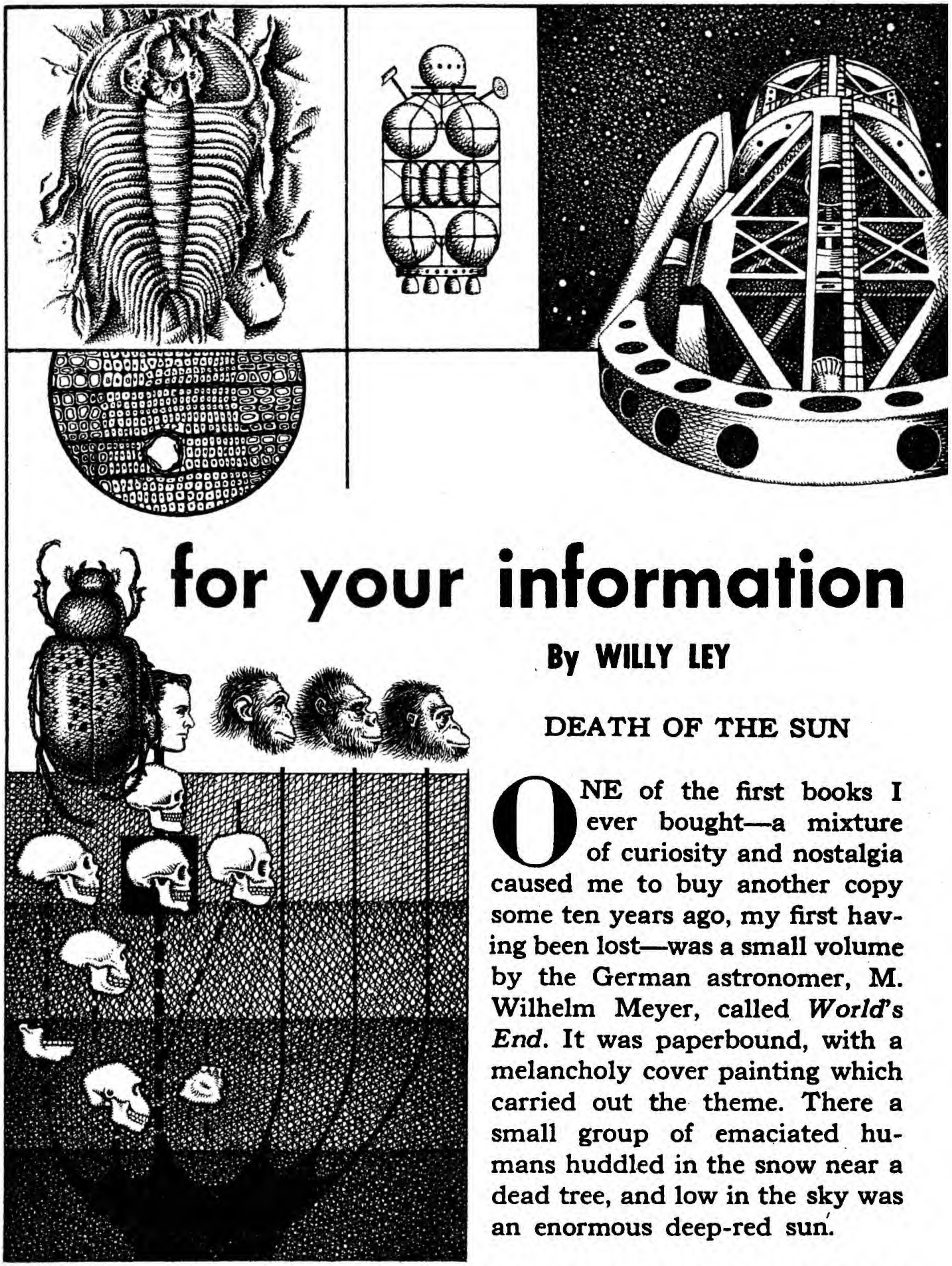
—**FREDERIK POHL**

FORECAST

Shoot the works may be fine for the customer, but it's tough on the dealer, who constantly has to worry about replenishing his inventory. Us, for instance, and Sturgeon, for another. We've given you two exciting Sturgeons in quick succession (one in this issue) and we're hauling off to offer you another next month—HURRICANE TRIO, a novelet that's a flaring pinwheel of ideas and emotions or, to follow the title, a literary storm that blows down a lot of intellectual deadwood and reveals a bright path through a fresh green forest of concepts. The prose here may seem enthusiastically impenetrable (true, though justified) and for a very simple reason—the story can't be described except in its own terms. And you wouldn't want a fine reading experience spoiled by being told who does what and why and what happens, except perhaps this much: The story opens with Yancey, who had died once, sharing a hotel bedroom with his wife and a truly alluring woman . . .

Another novelet, THE SERVANT PROBLEM by William Tenn, is even harder to forecast without giving away its startling twists and shock ending. You know Tenn, however—as devious an author as ever spun webs with a typewriter—and this story is a job of tricky weaving that any spider would envy.

Short stories, of course, plus Willy Ley and our usual features . . . and more information about the Galaxy-Simon & Schuster $6,500 prize novel that will soon be serialized here!



for your information

By WILLY LEY

DEATH OF THE SUN

ONE of the first books I ever bought—a mixture of curiosity and nostalgia caused me to buy another copy some ten years ago, my first having been lost—was a small volume by the German astronomer, M. Wilhelm Meyer, called *World's End*. It was paperbound, with a melancholy cover painting which carried out the theme. There a small group of emaciated humans huddled in the snow near a dead tree, and low in the sky was an enormous deep-red sun.

It was the same basic idea which had been painted with words by H. G. Wells in his *Time Machine*. You probably remember the story: After having seen and experienced the end of the human race on a trip into the future, the Time Traveler lets his machine race far, far ahead. At first, there is the "blinking succession of day and night" to which he has grown accustomed during earlier time trips, but as the machine continues into the future, things slowly change:

"The band of light that had indicated the sun had long since disappeared; for the sun had ceased to set—it simply rose and fell in the west, and grew ever broader and more red. All trace of the moon had vanished. The circling of the stars, growing slower and slower, had given place to creeping points of light. At last, some time before I stopped, the sun, red and very large, halted motionless upon the horizon, a vast dome glowing with a dull heat, and now and then suffering a momentary extinction. At one time it had for a little while glowed more brilliantly again, but it speedily reverted to its sullen red heat. I perceived by this slowing down of its rising and setting that the work of the tidal drag was done. The earth had come to rest with one face to the sun . . ."

IF I saw this old German painting or read the *Time Machine* for the first time now, I could date both painting and story from this one fact. Both would have to fall into the period from roughly 1880 to 1900, because of this dying red sun which looks so much larger because the Earth has moved closer to it along the tight spiral of a steadily shrinking orbit. Actually, the story was written in 1895 and the picture was painted in 1903—only ten years later, the writer would have been doubtful and the painter would have picked something else from the book.

The very question of whether the Sun might one day die was still relatively new when Wells actually wrote, strange as that may seem to us. It had been the subject of doubtful speculation and worried calculations for only a few decades. In earlier days, that question simply did not exist and we don't even have to go back to the time of Homer when the Sun was the chariot of the sun-god to find it lacking. While people had thought about the end of the "world" on and off in olden days, the possible end of the Sun had never been considered.

None of the Greek philosophers concerned themselves with this problem. The Roman writers had far more mundane things to consider. The Bible even stated, by

implication, the opposite: "while the earth remaineth . . . summer and winter, and day and night shall not cease."

Nor did the astronomical revolution started by Nicholas Copernicus change the picture. What *did* begin to change the attitude was not philosophical ideas, but facts which were uncovered because of the spare-time activities of one Jan Lippershey in the Netherlands, which resulted in the invention of the telescope. In December, 1610, it was found for the first time that the Sun was literally not spotless.

The man who usually is credited with the discovery of the Sun spots is the pastor David Fabricius, but part of the credit should go to his son Johannes, for father and son worked together in observing the skies with their recently acquired "optick tube." Johannes, in fact, saw it first.

The Sun, he wrote later, did not look as clear and smooth as he had expected. "It seemed to have various kinds of roughnesses and unevennesses, even at the rim. As I watched carefully, an unexpected darkish spot showed itself, not at all small as compared to the size of the Sun. I thought that drifting clouds caused the spot."

Even after reassuring himself "about ten times" that the spot could not be a cloud, "I did not trust myself completely and called my father . . ." The father-and-son team not only discovered the Sun spots, but, by observing them, the rotation of the Sun.

BEFORE David Fabricius had published the findings, a Jesuit priest, Father Christoph Scheiner, in Ingolstadt, saw several Sun spots. As required by his order, Scheiner reported his find to his superior Buseaeus, who listened carefully, thought for a while and said: "My son, I have read all the writings of Aristotle several times from beginning to end and can assure you that I found nothing in them which says what you tell. Go and calm yourself; be assured that what you believe to be spots in the Sun are flaws of your glasses or your eyes." *

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* This is not quite as bad as what was done some 45 years later. Christian Huyghens in the Netherlands had invented a new method for grinding and polishing lens. He built himself a telescope and promptly discovered Titan, Saturn's largest moon. He just as promptly discontinued his observations, reasoning that there were six planets (Mercury, Venus, Earth, Mars, Jupiter and Saturn) and now also six moons, that of Earth, the four of Jupiter discovered by Galilei and the one of Saturn he had discovered. Since the number of moons could not be larger than the number of planets, they obviously had all been found!

The Sun's corona was discovered, too, as soon as a suitable eclipse occurred. It was, of course, elementary knowledge even then that an eclipse was the result of the Moon moving across the line of sight from the Earth to the Sun. The question was which of the two was the possessor of the corona.

Around the year 1700, Giacomo Filippo Maraldi, a nephew of the great Jean Dominique Cassini, and famous as an astronomer in his own right, stated as his opinion that the corona was the atmosphere of the Sun which suddenly became visible during a total eclipse. But the majority of his colleagues considered it much more probable and "reasonable" that the corona was the atmosphere of the Moon, which was illuminated for good visibility only if the Sun stood directly behind it.

The question was solved by elimination: The more the Moon was observed, the clearer it became that the Moon did not have an atmosphere worth that name. Hence the corona had to belong to the Sun.

Yes, but what were the Sun spots?

Galileo Galilei believed they were black—or at least dark—clouds that were high above the luminous surface of the Sun. Others did not contradict this view, but were more specific—these were the dark clouds that formed above gigantic volcanoes in eruption.

A few decades later, about 1670, it was Cassini who turned the idea around. The Sun spots were not dark clouds of one kind or another, but just the opposite: When a storm tore a hole in the luminous cloud layers of the Sun, it might grow tenuous enough to be pierced by a vast black mountain peak on the Sun's surface.

THAT it might be the Sun's atmosphere which was luminous while the surface was dark was not Cassini's original idea. It had been uttered somewhat timidly at an earlier date by pointing out the highly luminous clouds we now call sunset cumulus and which are so much brighter than the ground. Cassini's authority merely reinforced this older idea.

A century later—things did not move as fast then as they do now—Cassini's special contribution to this theory was removed, but the theory itself seemed strengthened some more.

In November 1769, the Sun sported an especially large spot and Alexander Wilson in Glasgow, who observed it with meticulous care, realized for the first time what virtually everybody knows now from photographs.

Such a Sun spot was not just a dark blot; it showed some differentiation in itself. The center was really dark, but between this dark spot and the surrounding bright surface of the Sun was a medium-dark area. When such a spot had wandered all the way to the rim, one could see that perspective made the relative positions of the dark center spot and the not-so-dark surrounding area shift.

In short, one could see that the semi-dark area was lower than the surrounding luminous area, while the dark center area was still lower.

Obviously, then, there were several layers in the Sun's atmosphere, one highly luminous top layer (but still below that ghostly corona one could not normally see) and a less luminous lower layer. Each layer developed holes on occasion and if the holes in both layers happened to match, we could see the dark "real surface" of the Sun.

Although Sir William Herschel held to the maxim that "it is sometimes of great use in natural philosophy to doubt of things which are commonly taken for granted," he wholeheartedly accepted Wilson's reasoning. He only made a minor correction: Wilson had spoken of the "lower layer" as less luminous, whereas Sir William considered it to be dark. We could see it at all only because of the fact that it reflected the light of the higher luminous layer.

In the elder Herschel's opinion, the surface of the Sun was *protected* against the heat and glare of the top layer by this reflecting and absorbing lower layer. To bolster the idea that all the luminousness might originate only from the Sun's upper atmosphere, Sir William pointed out that all heavenly bodies, "we have pretty good reason to believe, emit light in some degree." The dark side of the Moon did so on occasion—actually reflected Earthlight which is reflected sunlight in the first place—the night side of Venus often glowed (probably aurora) and, in the polar night of the Earth there was the glowing *aurora borealis* in the north and the equally bright *aurora australis* in the south.

IT was a difference in degree rather than a fundamental difference. "The sun's similarity," Sir William wrote in 1794, "to the other globes of the solar system with regard to its solidity, its atmosphere and its diversified surface; the rotation upon its axis, and the fall of heavy bodies, lead us on to suppose that it is also most probably inhabited, like the rest of the planets, by beings whose organs are adapted

to the peculiar circumstances of that vast globe."

We would be hard put nowadays to invent anything wilder than this concept, but it covered all the then available information. As long as not even the nature of chemical combustion was properly understood, it made sense.

To us, it seems like an especially striking contrast that Herschel, with such a concept in mind, also tried to establish whether the Sun spots influenced the weather on Earth. Having neither astronomical nor meteorological statistics available, he picked the only one there was—the recorded wholesale prices of grain. Even so, he might—with luck—have discovered the Sun-spot cycle, but the tool was too inadequate.

The actual discovery of the Sun-spot cycle by Heinrich Samuel Schwabe did not take place until 1843, but around 1770, a Danish astronomer had resolutely entered a remark in his daily diary to the effect that "in time, a periodicity of the Sun-spot phenomenon will be found, since every other astronomical phenomenon shows periodicity."

Herschel's concept of the Sun was not disproved by one man and one discovery at a specific date. It seems to have died very gradually, its last remnants being swept away by the discovery of spectrum analysis in 1859.

In the meantime, a large number of other discoveries had been made and some known phenomena had been thought about. By 1840, no astronomer doubted any more that all the so-called fixed stars were suns, too—as had been guessed by an Arab eight centuries earlier—and the phenomenon of the Milky Way had been explained, by Herschel as a result of observation, and by Immanuel Kant independently by careful reasoning. One of the discoveries that became importaant was that some stars showed definite colors. That some were red was obvious, but there also were blue ones.

So stars could have different colors—at that time, it was just an item of information to be filed away.

THEN there were the recurrent "new stars." Pliny the Elder reported that Hipparchos had started his famous star catalogue because of such a new star. You could not tell whether a star was "new" if you did not have a list of the "old" ones.

Two or three other new stars had been reported from Roman times. Then there had been one during the ninth century when Arab astronomy was at its peak under Caliph al-Mamun. In 1012, Hepidanus, a monk of St. Gallen in Switzerland, listed another

"new star" in his *Chronicle of Miracles*. One especially famous super-nova, to use the modern term, occurred in the time of Tycho Brahe (1572). Another one soon after, in 1604, has often been called Kepler's new star. Jean Dominique Cassini got "his" in 1670; then there was a pause until 1848.

Of course, there have been quite a number since, but the ones that influenced thinking in 1840 were those associated with the names of Tycho, Kepler and Cassini.

If stars could have different colors, would it be possible that there were *dark* stars? When Alexander von Humboldt wrote jokingly in a letter about such dark celestial ghosts, the then famous astronomer Friedrich Wilhelm Bessel (the first to measure the distance to a star, 61 Cygni) replied simply: "that innumerable stars are visible obviously does not disprove the existence of an equal number of invisible stars." So if there were dark stars and also "new" stars, wasn't the simplest explanation of the "new" stars that two dark stars had collided? Thus the novas seemed to furnish a roundabout proof for the existence of dark stars.

Such an event was both end and beginning, but the idea of "the end" had entered astronomical thinking, so to speak, by the back door. For what were the dark stars?

In 1814, Joseph Fraunhofer, discoverer of the lines named after him and *almost*-discoverer of spectrum analysis, had compared the lines of various stars. He had found that his lines were in places where the Sun did not show lines and had concluded that there probably were different kinds of stars.

Fraunhofer's discovery had come clearly too early to be fully understood. It took until 1860, when Giovanni Batista Donati came across Fraunhofer's statement in an old volume of the proceedings of the Munich Academy of Sciences. Donati himself went to work on the problem, but most of the work was done by Father Angelo Secchi, the Papal Astronomer.

ANGELO Secchi sorted all the stars he investigated into four classes. Class I were the "blue stars" of which Sirius and Vega are examples. Class II were the "yellow stars" with our own sun as the prime example. Class III were the "red and orange stars," such as Betelgeuse and alpha in Hercules. Class IV, finally, was a type of which very few and very small stars were then known. They were dark red and their spectrum was strange.

Such stars, Father Secchi wrote, "which show such zones in their spectra must have a lower temperature than those which show only the fine lines (of Fraunhofer)." In fact, the explanation seemed to be that the stars of Class I and Class II were far too hot to permit the existence of chemical compounds, while the stars of Class III and especially of Class IV were not hot enough to prevent their existence.

We now know that this is wrong, but the consequences of this careful pioneer work were very obvious: Secchi's four classes were clearly four successive stages of a star. Or a sun. At first, it began hot, blue-white. In the course of time, it cooled to yellow. Then to orange. Then to red. In the end, it was too cool to be visible at all—Bessel's dark stars.

So far, everything looked logical and fine. The stumbling block appeared with the logical enquiry of how long this development would take. It was the same question as "what keeps the Sun going?" There were estimates of how much heat the Sun produced. We know that these estimates were too small, but they appeared enormous.

John Tyndall (a physicist, not an astronomer) said in despair, "the facts are so extraordinary that the soberest hypothesis must appear wild." The Sun kept everything going on Earth, as had been well realized by then, but the Earth intercepted only a tiny fraction of the Sun's production of heat and light. Any reasonably bright high-school boy, knowing the diameters of the Sun and the Earth and the distance between them, could calculate just how much radiation the Earth intercepted. The figure is on the order of 1/2,200,000,000.

A few scientists (but not physicists), both astonished and somewhat frightened by such figures, tried to think a way out. Maybe the Sun did *not* radiate into space in all directions. Maybe radiation between the Sun and the planets was a proposition resembling static electricity—it went only in the direction in which it was received.

This was a somehow valiant guess, utterly wrong, of course, and promptly disbelieved by every expert, even before James Clerk Maxwell's *Treatise on Electricity and Magnetism* in 1873 furnished the final demolishing weapon.

The fact remained that the Sun threw enormous amounts of energy into space. Where did it come from?

SIR William Thomson, the later Lord Kelvin, made a quick side calculation. Even if the Sun consisted of the best grade of an-

thracite and were furnished with the necessary oxygen, it would not last more than 5000 years, so it could not possibly be chemical energy. In the first place, it obviously wasn't. In the second place, geologists had already shown that the Earth was far older than 5000 years and that, moreover, there had been life on Earth for a very much longer period.

But what other energy than chemical energy was there? Here Hermann von Helmholtz had given an answer. The Sun must have had a beginning and the only possibility one could think of was that it had condensed out of cosmic dust. It must have been large and loose in the past, but the mutual gravitational attraction of the particles caused this body to condense into what we now call the Sun. Such contraction generates heat. Helmholtz advanced the theory, for the first time, in 1853, that the Sun kept going by continued contraction.

Calculation showed that a contraction of about 300 feet per year should account for the observed release of energy. And since, with contraction, its surface is diminished, it should actually grow hotter. Because the contraction would amount to one mile every 17 years and the diameter was 864,000 miles, however, the shrinkage would be too small to detect easily. It certainly could not be detected by comparing older records with modern (1860) observations.

Extrapolating backward from this idea, it turned out that the Sun could not be older—as a shining star—than 18 million years at the most. Simon Newcomb, extrapolating forward at a later date, calculated that after five million years, the Sun would have shrunk to half of its present diameter and be eight times as dense. After that, the ability to contract any more would be drastically reduced and the temperature would have to fall off sharply.

The overall conclusion was that the Sun would last another eight million years or so.

The maximum figure of 18 million years for the past was greeted with pleasure at first by the geologists, who found in their own researches that every new discovery they made needed more elapsed time. But the geologists kept on making discoveries and the figure of 18 million years soon grew tight for them.

Well, astronomers and physicists interested in astronomical matters were willing to oblige with an alternate idea. Lord Kelvin, who himself estimated the age of the Earth as about 100 million years, was in favor of the meteoritic theory, which claimed

that the Sun maintained its heat by the impact heat of the steady rain of meteorites that must fall into it.

TO get a grip on the problem, Lord Kelvin calculated how the solar furnace would be stoked by the impact of the planets it now has. If Mercury fell into the Sun, it would make up for the energy release of about 6½ years and Venus would account for nearly 84 years of energy release. The table looked as follows:

Mercury	**6.6 years**
Venus	**83.8 "**
Earth	**95.0 "**
Mars	**12.6 "**
Jupiter	**32,254.0 "**
Saturn	**9,652.0 "**
Uranus	**1,610.0 "**
Neptune	**1,890.0 "**
Total:	**45,604.0 years**

From this table, one could calculate back how much matter would have to fall into the Sun daily to keep the process continuous. The result happened to produce a nice even figure: If a mass equal to 1/365th of one per cent of the mass of the Earth fell into the Sun daily, it would account for the energy release. Rounded off: one Earth-mass per century. This would not show up as an increase of the diameter of the Sun for a long, long time.

If the geologists had balked at the contraction hypothesis because it did not allow them enough time in the past, the astronomers balked against the meteoritic hypothesis because it would put too much matter into space.

If the equivalent of one Earth-mass fell into the Sun every century, the equivalent of several Earth-masses—no, of scores of Earth-masses—must be in space reasonably near the Sun.

But the astronomers would see them. The Earth itself, for one thing, would find a heavy meteoritic bombardment going on all the time. The orbits of the inner planets would be influenced. It might work theoretically, but it did not agree with observed facts. It was like saying that the observed level of street noise at a busy intersection could be accounted for by pistols being fired at the rate of four rounds per second. The noise might be the same, but the bullets would cause other effects which, however, did not show up.

The majority of astronomers thought along a different path. The observed energy release of the Sun—facts first!—could be accounted for by either of these two theories. But either should have effects which disagreed with observation. Therefore, both probably worked together.

A steady hail of meteorites stoked the solar furnace, but

there was not enough to replace all the lost heat. The difference was made up by contraction which, under these circumstances, could be much slower. Hence the geologists got more time in the past because of lesser contraction, while the observing astronomers were still not asked to accept larger amounts of cosmic matter than they would willingly do.

ALL this could be made to account for continued sunshine. But most likely there were elaborations. One could see the red suns in space. They had obviously run out of meteoric material and then contracted as far as possible, after which they only lost heat, with no chance of replenishing the supply, until their temperature had dropped to the point where chemical compounds became possible. Soon they would be completely dark.

But if they had planets, there would be respites, just as suggested by Lord Kelvin's calculations. The planets, moving around their suns, must find some slight resistance—infinitesimal, to be sure, but resistance nevertheless. Slowly, their orbits would shrink and finally one would crash. The sun would be rekindled — remember Wells: "had for a little time glowed more brilliantly again" — and then slowly disappear again in reddish blackness until the next planet crashed. Seen from a long distance, this would be one of the "new" stars.

This concept also explained the observed fact that these new stars did not last long. They suddenly flamed into enormous brilliance from "nothing," outshone everything else for months, but then became faint and could not be found any more after a few years. If they had been collisions between two dark stars, they should be permanent as far as short-lived humans were concerned. But a crash of a small planet seemed to fit the facts.

Extending speculation a bit, there were two schools of thought. Both agreed on the general scheme for quite a long way. A star formed somehow and, with the aid of meteoric material and contraction, it kept shining for a long time, until the meteoric material was used up and contraction, as higher densities were reached, became more difficult. Near the very end came the borrowed time of the planet crashes.

The question was—and here the two schools of thought differed from each other—what was likely to happen if you did not look at one sun, but at all of them together—at the Galaxy, as it were?

One party maintained that the

average number of luminous stars would remain substantially the same because of collisions of dark stars and the "original formation" of new ones. The other group maintained that the number of luminous stars must decrease steadily, for there was no "original material" left to form new stars and every pair of dark stars that met would make just one new, though larger, luminous star.

Therefore, after eons and eons of time, all the matter would be concentrated into just two supergigantic stars. Alone in space, they would, of course, attract each other and these two would suffer a head-on collision of enormous masses striking at fantastic speed.

This unimaginable collision could not produce a single star. It would disperse the matter of both!

But the end of one cycle would be the beginning of the next, for then there would be again matter in space, to condense and form completely new stars and planets and moons!

THE picture was complete around 1890.

In 1896, the professor of the *Ecole Polytechnique,* Antoine Henri Becquerel, put uranium ores into the same desk drawer in which he kept unexposed photographic plates, wrapped in black paper. Two years later, Pierre and Marie Curie isolated something they called polonium.

And in 1910, Dr. Ralph Allen Sampson, the Astronomer Royal for Scotland, when asked to write the article "The Sun" for the forthcoming new edition of the *Encyclopaedia Britannica,* only expressed the general feeling when, after reciting the older ideas, he wrote: "a source which seems plausible, perhaps only because it is less easy to test, is rearrangement of the structure of the elements' atoms. An atom is no longer figured as indivisible . . ."

The no longer indivisible atom was to turn most of the older ideas upside down once more, as we'll see in next month's conclusion of this discussion.

—WILLY LEY

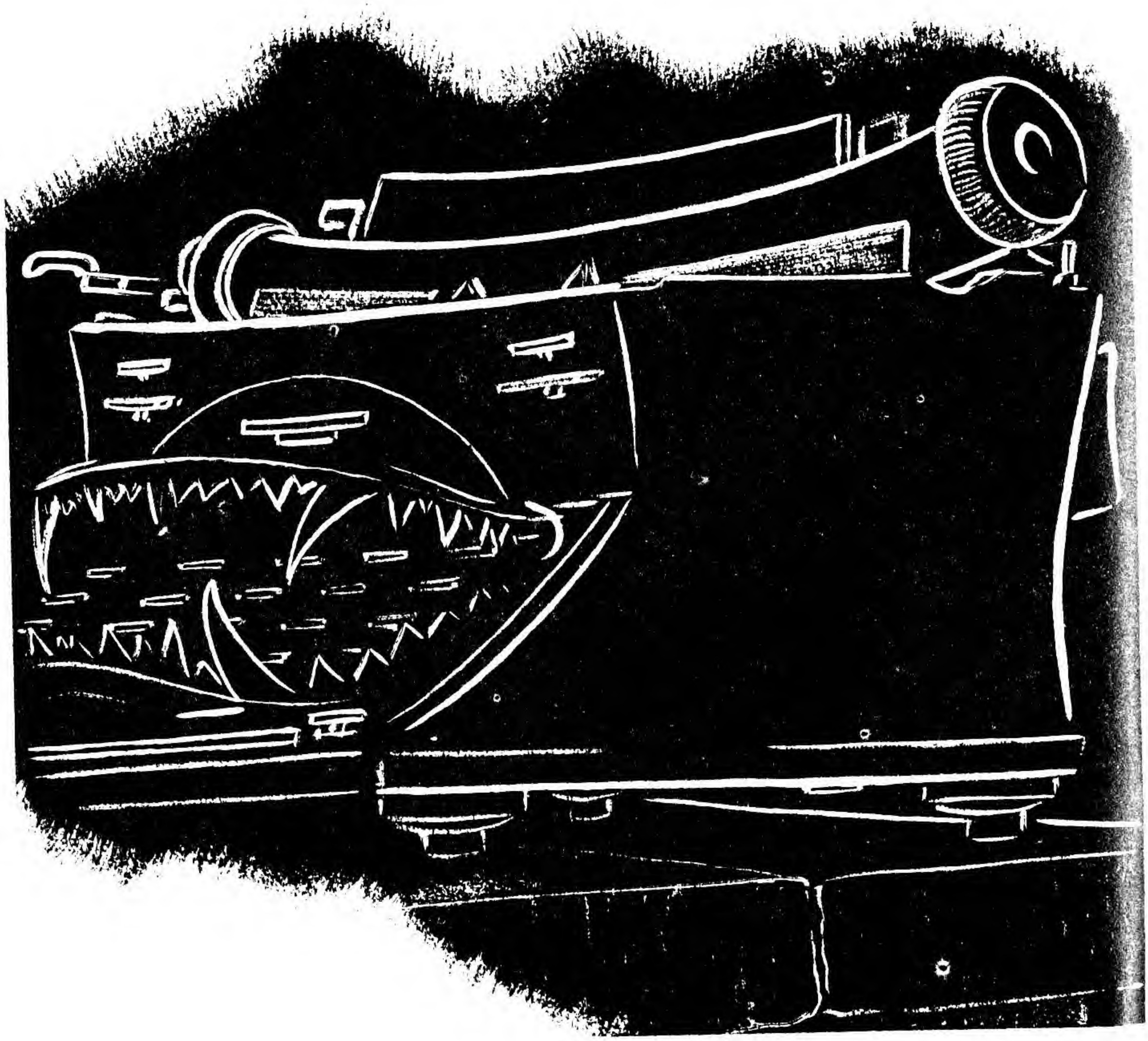
FIFTH FANVET CONVENTION: In New York City—Sunday, April 17th, 1 P.M.
Werdermann's Hall, 3rd Ave., East 16th Street.
Only admission is your interest in science fiction.

THE AGACON: In Atlanta, Georgia—April 2nd and 3rd.
Mail dollar registration fee to 1st Annual Southeastern S-F Conference
c/o Ian T. Macauley, 57 East Park Lane, Atlanta 5, Georgia.

Dulcie & Decorum

By DAMON KNIGHT

Illustrated by MEL HUNTER



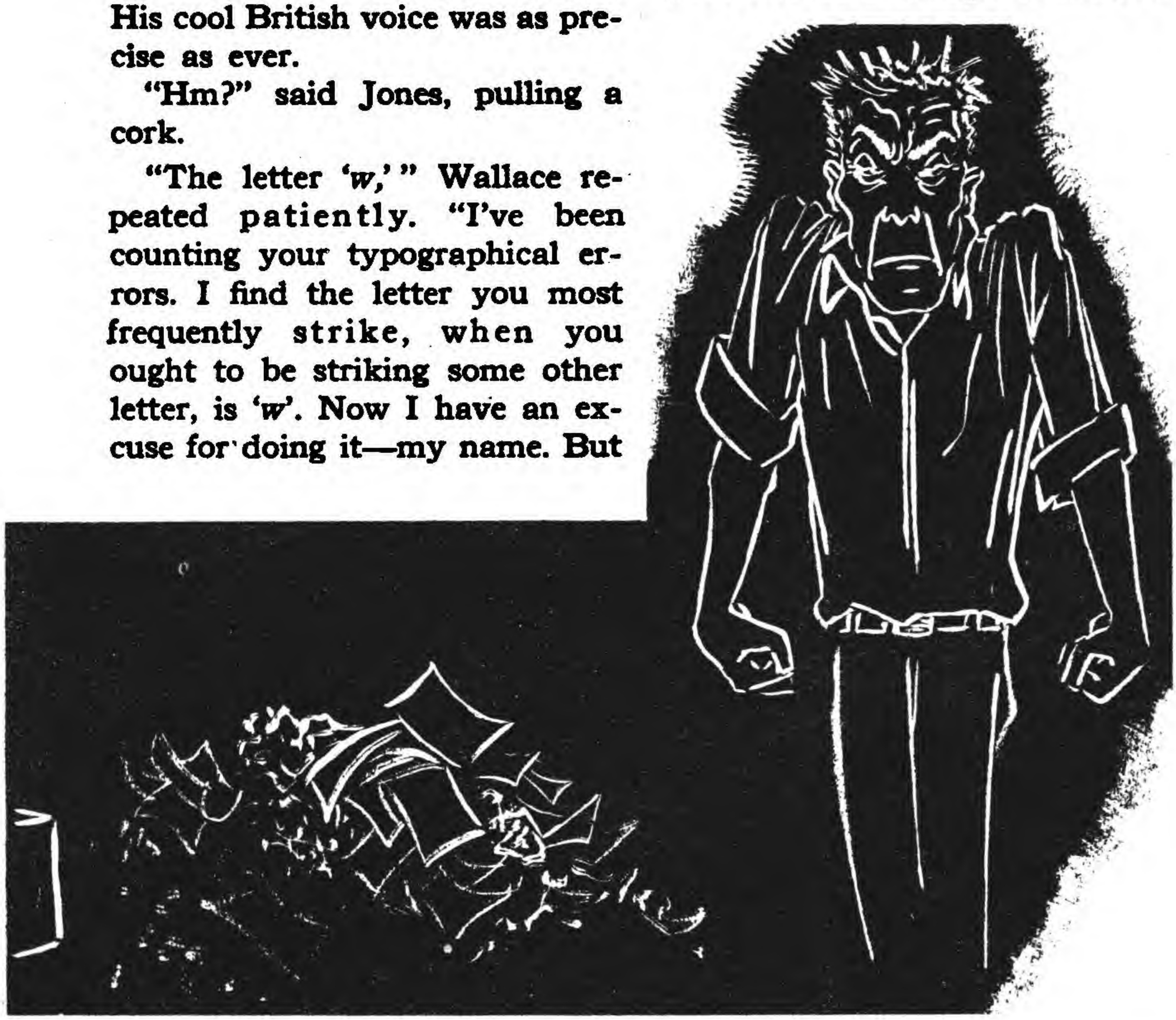
If you make typographical errors in typing, leave them alone! The biggest mistake is in trying to learn whether they mean anything!

"WHAT is so fascinating about the letter *w*?" Wallace asked, looking up from the typed pages. His cool British voice was as precise as ever.

"Hm?" said Jones, pulling a cork.

"The letter '*w*,'" Wallace repeated patiently. "I've been counting your typographical errors. I find the letter you most frequently strike, when you ought to be striking some other letter, is '*w*'. Now I have an excuse for doing it—my name. But what's yours? Why '*w*'?"

Jones got the cork out and filled both glasses. "You're supposed to be reading the article."



"Couldn't possibly," Wallace said. "Awfully sorry. Full of Americanisms. I get fearfully loyal when I'm drunk. Language of Shakespeare and Milton and Robie. You know."

"*Robie?*"

"My editor. *Fil*thy little bug. Writes himself, you know. Under pseudonyms. Asks you casually how you liked so-and-so's last piece. Actually his own, you see. *Ugh.*"

JONES was beginning to feel mildly, pleasantly dizzy. It was quiet and cool down in his basement study at this time of night, with the house silent above them and the night airs astir. He and Wallace had been drinking and talking ever since four that afternoon, when they'd met at a press conference that turned out to be a bust. Wallace was a feature writer for a chain of British papers; he was just beginning a two-months' g r a n d t o u r o f America.

"Quite sinister," Wallace said. "Bear looking into. I should like to have your opinion, Jonesy. How do you explain it?"

Jones swallowed, and the cool brightness went smoothly down to join the warmth at the bottom. He said, "Maybe he has expensive tastes."

"Who?"

"Robie." He added, as Wallace looked blank, "Your editor."

"What's that to do with '*w*'s?"

"I don't know," Jones said. After a while, he got up and sat down at the desk with his hands resting on the typewriter keyboard. He twiddled his fingers experimentally a few times. "I think my fingernail catches on the '*w*' key."

Wallace nodded several times. "Yes. But why?"

"Probably stands for something Freudian. Women. Woe. Waste."

"Wallace, in my case," said Wallace. "Scots wha hae."

Jones was slowly warming up to the topic. "No, you were right. I just remembered—when I used to work for a publicity man, years ago. I knew the crumb was getting rich and I had an idea he wasn't paying me enough. Thirty-five dollars a week. Well—" he typed rapidly—"I *swear* I never did it on purpose, but I kept typing his name like this."

He handed the sheet over to Wallace. It read: $IDNEY $TEVEN$ON.

Wallace grinned. "I see. And yet the almighty dollar sign's nowhere near the 's,' is it? Not even the same finger."

"No."

"Well, this is interesting. What about the '*w*,' then? I don't much care for your theory, but evidently there's a psychic message

there. *'W'—'w'—'w.'* Wa, wa, wa. Baby crying. Maybe you weren't allowed to howl enough as a child."

They drank, thinking it over.

"You're going on the theory," said Jones, "that all typos have some sinister significance."

"Oh, absolutely."

"Well, that doesn't stand up. No. I hit *every* letter wrong *sometimes*. If they all mean something—well, hell, how do you know you know they mean anything? You're sure to hit a wrong one every now and then. Am I getting through to you? What I mean—"

"Know exactly what you mean," said Wallace. "Question of frequency. *Frequency*."

"Oh," Jones said weakly.

"Doesn't follow, though."

WALLACE got up to look over Jones's shoulder. "The *'w'* happens to be in the middle of a nest of high-frequency letters, doesn't it? *'E,' 'a,' 's.'* Hold on—I've got it! Suppose somebody were trying to communicate with you!"

"They could write me a letter," said Jones.

"No. No post where he is. Cloud-cuckoo land, or Mars, or somewhere. You follow me?"

"Or the spirit world?" asked Jones, interested.

Wallace collapsed into a fit of silent laughter and spilled wine down the front of Jones's shirt. "Be sensible," he said happily. "Practical. Hard-headed. Some psychic little tout in Soho, asleep and dreaming of you. Or one of your remote descendants, centuries from now. A by-blow of your great-great-grandnephew's brother-in-law's mistress. Somebody reaching back in Time, you see, or forward, for that matter. Trying to *communicate*."

"What for?"

"Are you going to be difficult? How the deuce do I know what for? You haven't even opened the bloody envelope."

He sat down again, looking miffed.

"I apologize," said Jones.

"Accepted," said Wallace. He sniffed dreamily, tenting his fingers in front of his long, pale face. "Now just suppose— How would a fellow like that go about getting in touch with you?" He held up a hand to forestall Jones's reply. "He's got a bad connection, you see. He can't make you hear voices, or do automatic writing, or anything like that. All he can do is twitch your fingers the least bit, when they're already moving and you're not paying much attention. Only then. Result, typos." He saluted Jones with his glass and drained it.

"Magnificent," said Jones.

"See any flaws in it?"

"Not a one."

"Very well, we shall see. Ready?" Staring intently at Jones's manuscript, Wallace read off the typographical errors as he came to them, and Jones typed them out.

The resulting message read:

OYKEIOXILERWJWJ.

"Settles that," said Wallace with relief. "All nonsense, naturally. Find something else to worry about tomorrow. Meanwhile, landlord, more wine."

THE next day was hot and sticky, and Jones had a hangover. He sweated on a story that had gone infuriatingly wrong somewhere and finally gave it up. He didn't tell himself he had given it up; he told himself he was killing time while his brain freshened itself.

The way he killed time was to go back through his manuscript and make a long list of typos. It was just as good as solitaire and, anyhow, there was a kind of witless fascination in it. Jones knew perfectly well that he was not going to find any message hidden in his typing errors, any more than the lint from his trousers cuffs would turn out to be pure uranium, but that didn't stop him. Millions of words have been written about Shakespeare and Bacon for less reason.

After a while, he had a long foolish row of letters, like this:

EMJBFTDHHTAAGDWWFF4
CDFZMG

So he returned to his work, which continued to go badly. He soon found himself mooning over the string of letters again, trying to rearrange them and break them up so they would make sense. Mostly, it seemed to him, the trouble was not enough vowels. He tried inserting vowels to make words like "job, fit, dough, hot," which was all right in a primitive kind of way, but not very satisfactory.

Well, suppose the meaning was in the letters he had *meant* to strike, instead of the ones he had actually hit? It was a possible hypothesis, no screwier than the rest of it, and it gave him an excuse to kill more time. So he went back painstakingly through the manuscript and tracked down every typo again, and under each he wrote what the letter should have been:

EMJBFTDHHTAAGDW
JOUGNSRGISQQIVE

WFF4CDFZMG
MESESGGDLC

Using the same system, the

best he could do with the second line was "Jurgen's rig is QQ I've messes GDLC." Not much help.

Dividing the letters into clumps of four and reading each backward across the top, forward across the bottom, gave him "Me Jo, U jug," followed by gibberish, and the word "this," just as plain; then drivel again.

He tried reading the whole sequence backward. Then he tried to break it as if it were a simple substitution code; but this was going too far. Jones gave it up.

HE went back to his story and actually wrote a paragraph before another idea came to him.

Even if you assumed that some typos were market tips from the Moon, or hiccups of the subconscious, or whatever, you had to figure that some typos were typos. "*W*" for "s," now—perfectly natural mistake. But "w" for "j," say—all the way across the keyboard—would be something else again.

On the typewriter keyboard, Jones discovered, "J" was directly under "U." He crossed the two letters out. Five more pairs went the same way, leaving a string of typos which, when you came to think of it, were pretty odd—like "E" for "J"—different fingers, different hand, different row of keys.

He stared at what he had left:

EMJEFTDHHTAAGDW
JOUGNSRGISQQIVE

WFFACDFZMG
MESESGGDLC

Something about the bottom lines struck his attention. Under it, he wrote:

JONS RISIV MESSG DLC
JONES RECEIVE MESSAGE DLC

He blinked. "Be taking up Yoga next," he muttered. "Automatic writing. Old ladies at séances."

But, of course, he was hooked. It was that irresolvable "DLC" on the end that did it. "DLC" what? Doll carts, dull caddy, dollars and cents?

He reached blindly to the shelf over his desk, hauled down a book, opened it beside his typewriter and began transcribing. His fingers were nervous. He was making a lot of mistakes, he knew, but he didn't try to do any better; he just kept banging away, eyes fixed on the open book, breathing in little agonized snorts through his nose.

He slammed the line-space lever and the paper tilted out of the machine; he was at the bottom of the page. He took the

paper almost angrily, smoothed it out, began listing errors.

After a few minutes, this is what he had:

ERWFTUOIFAHJKKA
JOANSOLKBENOB ;E

UWIFJYWVJW
OSKBEISDLC

JONS OBE OBE OBEI DLC
JONES OBEY OBEY OBEY DLC

He got drunk all over again, sobered up and wrote a letter to Wallace in care of the New York office. He wrote the letter in longhand—four pages of it—and sent it off before he had a chance to lose his nerve.

JONES did not touch the typewriter again for almost a week, in spite of two sharp arguments with his wife, until the letter came from Wallace:

Hotel Imperial
Deadwood, Ariz.

Dear Fred,

Well, you're right and I apologize for several things that occurred to me when I got your letter.

I am absolutely bowled over, but will try to get some first impressions down.

Your letter arrived Thursday. Friday night, I had just finished a piece and I tried your system on it, feeling seven kinds of a fool. This emerged: Wals (me) cntakt dcrm. (Darkroom?) Not the best spelling, but the parallel with your message is impossible to ignore, and of course there is no way on Earth you could have engineered this, so I am stuck with the thing.

Now pay close attention, please.

1. *I have no recollection of proposing this or any other theory of typos to you on that evening.* I know I was well along, but I *always* remember the next morning. Either you're mistaken or—well, let's move along.

2. I took the trouble to examine typescripts by three other newsmen I met here; there was nothing in them. Has it struck you that even if one of us should demonstrate this thing, by typing an unfamiliar text in the presence of observers, they'd be able to say we had memorized the message beforehand and deliberately made the required errors?

I don't mean that we couldn't get a hearing—nothing easier with a crackpot hypothesis like this, as you know—but that we'd convince nobody who'd be worth the trouble of convincing.

Later: It comes down to this, that we have either got to drop the thing now—and do you really see yourself doing that, turning out tons of copy between now & your 80th birthday and wondering all the while what grisly mysteries are concealed in the typos?—or else we are both of us going to wind up listing to starboard, two bonnets with but a single bee. If you see any way out that I've overlooked, speak up.

Still later: Have just been through several of my old scripts, a thing which has probably occurred to you, too, by now. There is nothing in them; nothing in anything until just last week. I don't like this. I don't like it in the least.

Why us?

(In pencil) To save you the trouble, the typos in this letter spell out: Wlas (me again) fil fil be be dcrm.

I haven't the slightest idea what it may mean, but for some reason it bothers me more than the other one.

I keep thinking of that "dcrm" and it reminds me of Chesterton's "The Man Who Was Thursday"—do you know it?—that terrifying business about the giant who turned out to be giving everybody their orders, anarchists and policemen alike, while sitting in a pitch *dark room.*

Feel feel be be. I've got a headache. Write when you can.

Best,

Walt

THE following morning, Jones went uptown to the offices of the news service for which he did most of his work. As a free-lance feature writer, he should have gone to the Reading Room of the New York Public Library instead, but he had ancient privileges and felt more at home in the news service's compact reference library.

He looked in the Unabridged first, then in the Dictionary of Abbreviations.

He found no D. L. C. and no D. C. R. M.

D. L. S. was Doctor of Library Science. Jones snorted. Or if you inverted it, D. C. L. was Doctor of Civil Law. There was a C. R. O. M., meaning *Confederació Regional Obrera Mexicana;* you could put a D. on the front to stand for *Director* . . .

What if they were phonetic spellings, though? Everything else in the "messages" was DLC and DCRM. Dulcie and—uh—Decorum. Dulcie and Decorum! He felt a quickening of interest. That meant something, if only—

Phil Mann shuffled into the room and stood quietly watching him, comfortably paunchy in a knit sports shirt, pipe in his hand. Jones looked up.

"Find it?"

"No," said Jones abstractedly. Now what the devil was it that he'd been on the verge of?

Mann glanced at the dictionary on the table. "If it's abbreviations you want, that guy out there is your man."

"Yeah?"

"Sure. I think you met him once. Sam Fowler. Does crossword puzzles for the *Trib.* Any cockeyed combinations of letters, he knows."

Fowler was pudgy and fat-lipped; his eyes were enormous behind swimmy lenses. He gazed

at the ceiling, stroking his chin. "D. L. C.," he said. "Doctor of Literary—Doctor of Library—Nup. D. C. R. M. Hmm . . ." He shook his head.

"I didn't think so," said Jones. "It was just a—"

"Wait a minute, wait a minute."

Fowler shook a fat palm at him and went on staring at the ceiling. He shifted on the edge of the desk, moved his lips once or twice, sniffed, and went on staring.

Mann wandered over to look at one of the softly clicking teletype machines and wandered back again.

At last Fowler said, "Only thing I can think of—don't know whether it'll help you—"

"Yes?" Jones encouraged.

"Computer names. Not any that *I* ever heard of, but they're making new ones all the time. Digital Linear Computer. Digital Computer—ah—Recompensaeing, Military. Something like that. Not those, of course. Computer names."

Jones was heading for the door when Fowler called after him.

"Uh?" he asked, turning.

"Any periods?" Fowler repeated.

"Any—? Oh. No periods. Just DLC, DCRM."

"Computer names," said Fowler dogmatically.

AT home, mechanically transcribing from the open book on his left, Jones slowly realized that it didn't have to be computer names, for Pete's sake, at all. How about government departments? Department of Labor Controls? If you were going to imagine things, why not Department of Control and Regulation of Management?

Funny that hadn't occurred to him at the time. Or to Fowler. Jones felt a bit irritated; the man ought to know his own business better than that. And yet the idea of the computers had taken instant hold of his imagination. DLC and DCRM, two giant blocks of masonry, dull-lit, full of the smells of ozone and oiled metal, and the sound of purring . . .

He came to the end of a page and ripped it out of the machine. It was getting so that he hated to touch the typewriter; the keys were like little metal teeth that snapped back at him. Not enough sleep last night or the night before. He was on edge.

He forced himself to think about the government departments again while he tabulated errors. There was something so solid and safe about a government department. Department of Control and Regulation—

His fingers had gone numb. He stared down at his writing.

JONS ABC KLK ABCDEF
KLK ABC KLK DLC

It was as clear to his mind as if he had heard it in the rhythmic rotary murmur of one of the teletype machines at the office . . . JONES ABC (Click) ABCD EF (Click) ABC (Click) Dulcie. Idling up there in the big masonry block—idling (click) like a metal Red King (click) dreaming of a man named Jones . . .

"Dulcie!" cried Jones, strangling. "Dulce—*uh*! Dulcie!"

Little steel typewriter keys were stuck in his shoulder. He writhed.

"Wake up! Fred!"

He stared at his wife's face foggily. She was all blurry in the funny light from the bedstand.

"Dulcie," he said with a thick tongue.

She let go his shoulder and brushed a cable of hair back from her forehead. "Fred, what's the matter with you? You scared me."

He moved his lips and tongue experimentally. "All right," he mumbled.

"You're not awake yet," she said, studying him. "Who's Dulcie?"

"Just a nightmare." He shuddered. "Just another damned nightmare."

He threw the bedcovers back and started to get out of bed.

MYRA watched him in silence until he began putting on his clothes. "Where are you going? Do you know what time it is?"

"Half past three," said Jones, glancing at the clock. "Doesn't matter. Wide awake."

"Fred, sit down a minute. I want to talk to you."

Jones kept going out of the bedroom.

"Fred, I've taken about as much of this—"

"Not now!" he shouted.

He went on down to his study, clicked on the friendly lights and sat down by the window. He lit a cigarette. The fluorescent light on his desk began to hum.

"Stop that, damn you!" Jones yelled, and sprang at it. It toppled over, tinkled, sputtered maliciously, and went out.

Jones got the oilcloth cover from behind the filing cabinet, where he had tossed it years ago, and carefully draped it over the typewriter, not touching the metal with his fingers.

"Click," he said between his teeth, pulling the edges of the cover tight. "Go ahead and click."

After a moment, hesitantly, he picked up the telephone. He used a yellow pencil to dial 211.

"Long distance," said the whiskery voice in his ear.

"I want to make a call to

Deadwood, Arizona. Station to station. The Imperial Hotel."

Jones introduced himself to the thin voice at the other end of the line. "I'm trying to locate Mr. Walter Wallace. Did he leave a forwarding address or mention where he was going when he checked out?"

"Just one moment, sir . . . No, sir, Mr. Wallace hasn't checked out. He's still in the hotel."

"Ring him," said Jones. "No, wait a minute. Take a message. Tell him I'm grabbing the first plane out."

Wallace was waiting for him in his room. He was paler than ever. He seemed to listen to himself with a faint, incurious surprise.

"I was due to go on to Reno day before yesterday, but I didn't. No point to it until I get this thing settled. Awfully good of you to come out and compare notes."

The roar of the plane's engines was still faintly in Jones's ears, like a far-off, thunderous, metal surf. He heard himself ask, "Do you have nightmares?"

"Nightmares!" said Wallace faintly, with a wry twist of his lips. "Oh, yes. Any amount. I haven't touched a typewriter."

"Me, either."

"Now you'd think that would help, but it doesn't." Wallace laced his long, translucent fingers together, hunching himself like a large, pale spider in the maple chair, in the chintz-filtered sunlight. "Has it struck you," he asked slowly, "that none of the messages actually said anything? Told us anything? *Contact. Receive message. Obey.* Would you take the trouble to reach back two hundred years in time to say that to anybody?"

JONES heard his own breath whistling in his nose. "Why did you say two hundred years?"

"Oh, well," said Wallace, and looked away with a little smirk. "I have been sitting here thinking," he went on, "and do you know what else I've thought of? . . . I'm not boring you? Can't understand why not . . . I'm thinking of thrillers I read in my carefree youth, where the murderer would send you a note with some insidious Oriental poison on it. You see, it didn't matter what the note *said*. It could be anything. For example, 'What price umbrellas now?' You opened it up, and got the poison on your fingers, and then you were as good as dead. *That* was the real message."

"Listen," Jones asked after a moment, "what does it want? Can you feel that? Do you—"

"Want?" said Wallace. "Want? I don't know. We're finding out, though, aren't we? *We opened the bloody envelope.* Now they don't

need to muck about with typographical errors, you see. We're on the hook." He smiled. "What do you suppose the worm says to the fish?"

Jones sat dully in his rumpled topcoat with his hat on his knee. He was unshaven and his shirt was buttoned up wrong. He got a cigarette out of his pocket, looked at it and put it away.

"I do run on," said Wallace politely.

Looking at him, Jones discovered that Wallace was astonishingly flat. He was a nicely colored picture pasted up in the air in front of a flat chintzy wall, with light coming through from somewhere Outside . . . like the peephole boxes they had made in Sunday school when he was a kid, pasting up cut-out people and furniture from magazines, to stand there in a stifling shoe-box and be stared at.

It was a curious feeling. He knew that he could get up and step across the carpet and touch Wallace, and find him round and solid and breathing. But he knew it wouldn't mean anything; he could do it, yet it wouldn't be any sort of proof.

And looking at the flat illusion that was Wallace, he could see that Wallace felt the same about him.

He stood up. "We'll have to work together," he said. "Lick this thing. Must leave now."

"Oh, yes," Wallace agreed. "Awfully nice of you to call."

MYRA said, "I just can't get used to it." She was sitting on the dim side of the room, hands in her lap, looking at the carpet. Near her, Milt Kalish sat uncomfortably, wishing for more light and holding an unlit cigar in his hand.

From the next room came the intermittent sound of hammering.

"We don't know yet, Myra," said Kalish.

"Can't you *tell*?" she asked, with a bitter undertone. "I *know*. He's going to have to go to a sanitarium, or a rest home or whatever name you want to call it. He probably won't come back. I knew it and I could see it on your face, even before dinner. So why won't you admit it?"

Kalish sighed. "Maybe it isn't that simple."

"Simple!" she said.

Kalish did not move; his mind registered the implied resentment, classified it and filed it away. He said nothing and did not move, and his hostility toward the world of people stayed buried so deeply that Myra could only sense that it must be there, not feel it or use it.

The hammering started again and Kalish saw Myra's hands

clench. Then it stopped and there were footsteps in the kitchen.

Myra looked straight ahead.

Jones came into the room, stooping a little, his spectacle rims catching the light. He had a tack hammer in his hand. He went to the secretary, opened the top drawer and scrabbled up a handful of pencils.

"Fred," said Kalish, "have you got time to sit down and talk to me a little?"

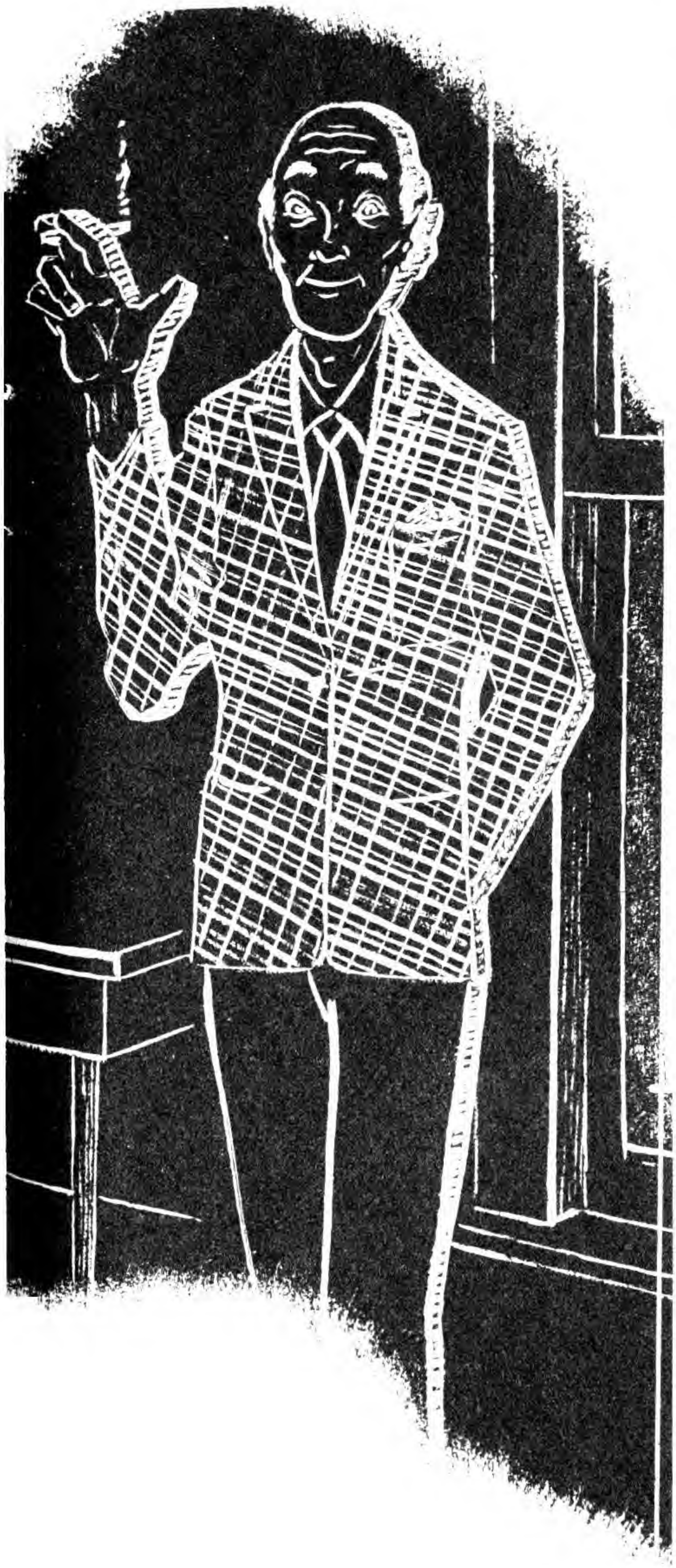
"*Shudas paparalishus,*" replied Jones. He turned around and went out.

Myra's voice was thin with strain. "What was that? More Russian?"

"No."

"What then?"

Kalish shrugged his shoulders and twisted his neck slightly. It helped the little tickle of pain between his shoulder-blades, but it wasn't a gesture he permitted



himself during office hours. "Lithuanian, perhaps. I didn't recognize it. I'm not really a linguist; I just pick up a few words here and there from my patients."

"What was that he kept saying all during dinner? *That* was Russian."

Kalish blinked. "Yes. *Pogebele*—ruin, devastation."

"Why Russian? That's all I want to know. We never had any trouble—I think I could stand it, but it's that one extra thing on top of everything else." She began to cry. "Russian!"

"You don't know where he might have picked it up?"

"No." She added bitterly, "Two nights ago—when I told you about, when I thought he was coming out of it—I asked him. And he said it was because his great-great-great-I-forget-how-many-times grandson was a Russian. Then I *knew* he was crazy."

JONES was building a maze. He had started with little rectangular strips of wood from an orange crate, all different sizes, and when the crate gave out he had begun using strips of tin, held together at the corners by all-purpose cement and lead pencils.

"Maze" was the nearest word. It was a little like a model for a mad architect's building, skeletons of rooms piled one on an-

other, first the wood from the orange crate; then tin, all at different levels, all open at the ends, so that you could look all the way through it. He did not know what he wanted it for.

Myra and some man were standing behind him, watching.

They didn't bother Jones. In one ear and out the other. Now a top piece here and then we start a new cell . . .

He reached for the tin and found only a snippet, not big enough for anything. There had been a bigger piece on the bench, he remembered, but no matter. He wandered down the bench, looking at things. There was a scrap of linoleum—

Somebody's arm in a blue pinstripe sleeve appeared just as he reached for it and took the linoleum away.

What else? Jones started musingly across the garage workshop, thinking and looking. Kerosene can—big one, empty, standing in the corner. He could cut that up with the tin snips, probably. But just as he got to it, the same blue pinstripe arm came and took it away.

Jones looked around in mild annoyance. The pinstripe man was standing there, with the can in one hand and the piece of tin in the other. Myra stood right beside him.

He reached for the tin; that would be better than fooling around cutting up a kerosene can. The blue pinstripe held it away from him.

"Fred, do you remember me? Milt Kalish? We used to live next door in Long Branch. Remember?"

"Kalish," he said agreeably, and reached for the tin again.

Pinstripe held it away from him. "Not quite yet, Fred. First tell me what you're building here. Can you tell me now? Do you want to tell me what you're building here?"

"A thing," explained Jones. He made descriptive motions with his hands. "You know."

MYRA put a handkerchief over her mouth and went away.

Jones reached for the tin.

"Not yet, Fred. Tell me, who is Dulcie?"

Dulcie . . . A pulsating hum. A close warmth. A darkness. He could feel her around him, especially when he closed his eyes, but she was a long way away. It was hard for her to talk to him, hard for him to listen.

"Is she a person?"

Ridiculous idea . . . He grinned, shook his head.

"Is Dulcie female?"

Well, yes. You would have to say so, he supposed.

He nodded.

The voice kept on. Had Dulcie told him to make the thing, what was it for, did he see her, hear her? "Does she talk to anybody else besides you?"

"Not yet," Jones said. And that was enough. He turned around and went back to his bench, in case the piece of tin should be there, after all, and it was. He cut rectangles of tin with the snips, carefully, and began to build a new cell that would finish the fourth tier.

Their voices trickled through his head. "I think we'll leave him alone now for a few minutes. You said there were some papers?"

"Downstairs. In his study."

Pinstripe was gone, which meant Jones could go on with his work.

He began cutting linoleum into neat strips. Linoleum would do fine.

"Fred—" she began weepily.

He was cementing the first wall of a new cell that had nothing to lean against. That was the hardest part, making the first wall solid and straight. People didn't know.

"Fred, can't you *talk* to me?"

The linoleum was working very well. He had no way of being sure, but he had a feeling he was almost through.

A Myra hand came and yanked away the rest of the linoleum. Jones noticed the heavy paper of the calendar on the wall and pulled it down. He cut a few strips of it experimentally.

It worked fine.

THE maze was finished. Jones knew what it was for.

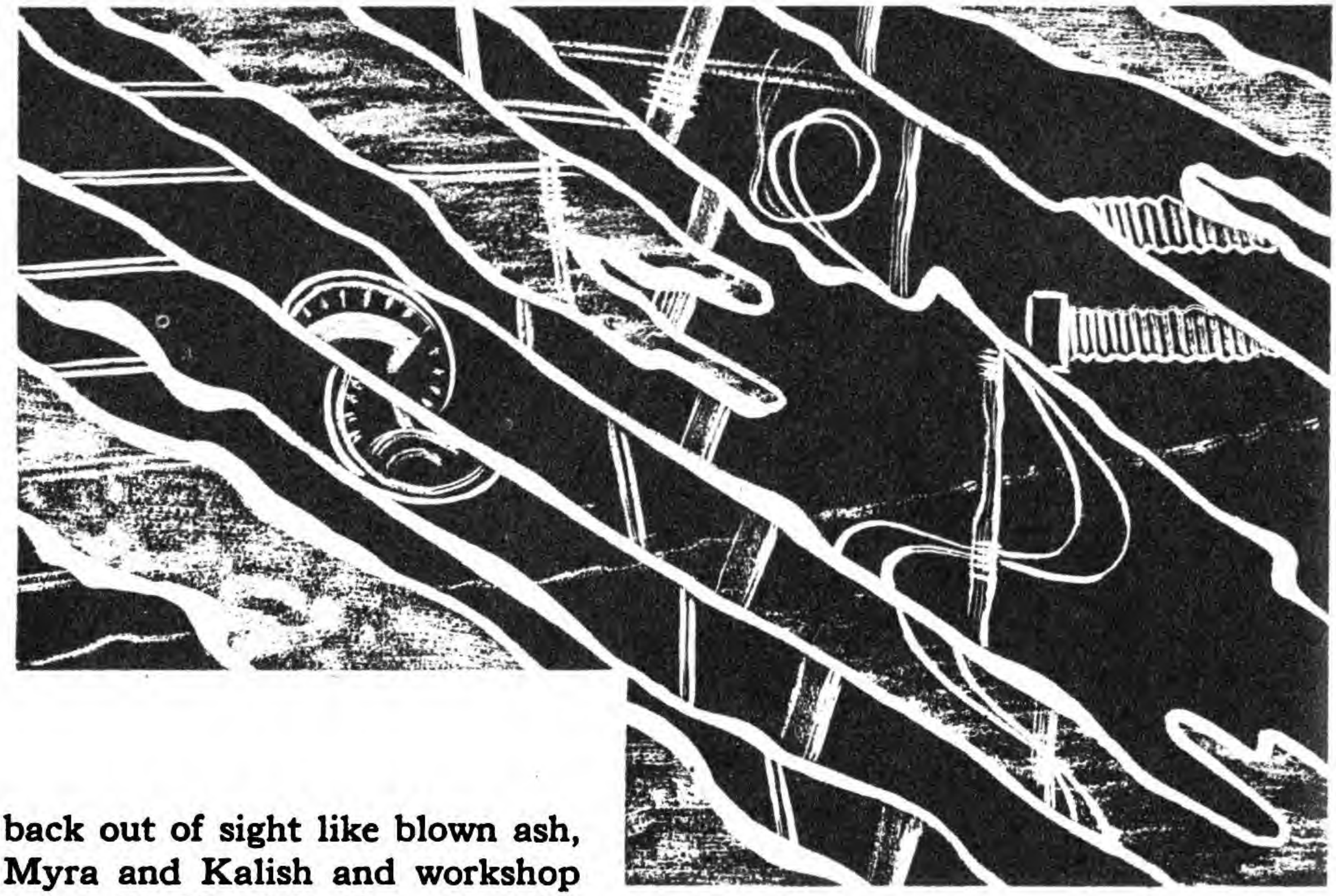
The reason it looked weird to other people was that it reminded them of a building. And of course, if you tried to make a building out of it, it was all wrong.

It was a model of something else altogether: a model of a way of thinking. It was, you might say, a constant reminder. In and around and down. *In* and around and down. Jones tilted the thing gently to see better. *In* and around and. *In and* around. *In* and. *In.*

It was like looking at one of those hypnotic spiral disks, but with a difference. Looking at a spiral only stunned your forebrain, opened up your skull to let any suggestion in. But looking into the maze forced your mind into a definite pattern, over and over—like tuning a radio receiver to one station, or like making a lock that would fit only one key.

Jones's mind was perfectly clear. He knew the maze was to make him hear Dulcie better. And he heard her.

When he shut his eyes, the world blackened and slipped



back out of sight like blown ash, Myra and Kalish and workshop and all. He felt the centuries wavering past him until he hung disembodied in tomorrow's twilight—

A cool dim place. Tip. Mind your hats goan in. A silence that trembled in the walls.

This was Dulcie. As he hung there, loving her, her knowledge flowed through him.

He remembered how it all began:

"Of course it isn't a substitute for the General Staff or anything like that. Human minds still have to make the decisions. But modern warfare involves so many factors that it really has become a mathematical problem. And to solve a mathematical problem faster, more efficiently, we use an electronic calculator—DLC. We know, incidentally, that the other side has been doing the same for the last three years."

After that, at first, Dulcie munched the little problems they gave her and ticked out the answers. But it happened that a human evaluation lost a battle and they set up the channels to feed information directly into Dulcie. And a human decision lost another battle and, not without fierce argument among themselves, they gave her the channels

of command. They had no real choice, except to wait until the other side did it to their computer first.

So Dulcie became a chess player. Her board was the planet, her pieces men and machines.

P to QB4: and down rained a hell of missiles that pretended the rooftops were not there, nor the people under them, nor the ships in the harbor, nor the boys playing ball outside the town.

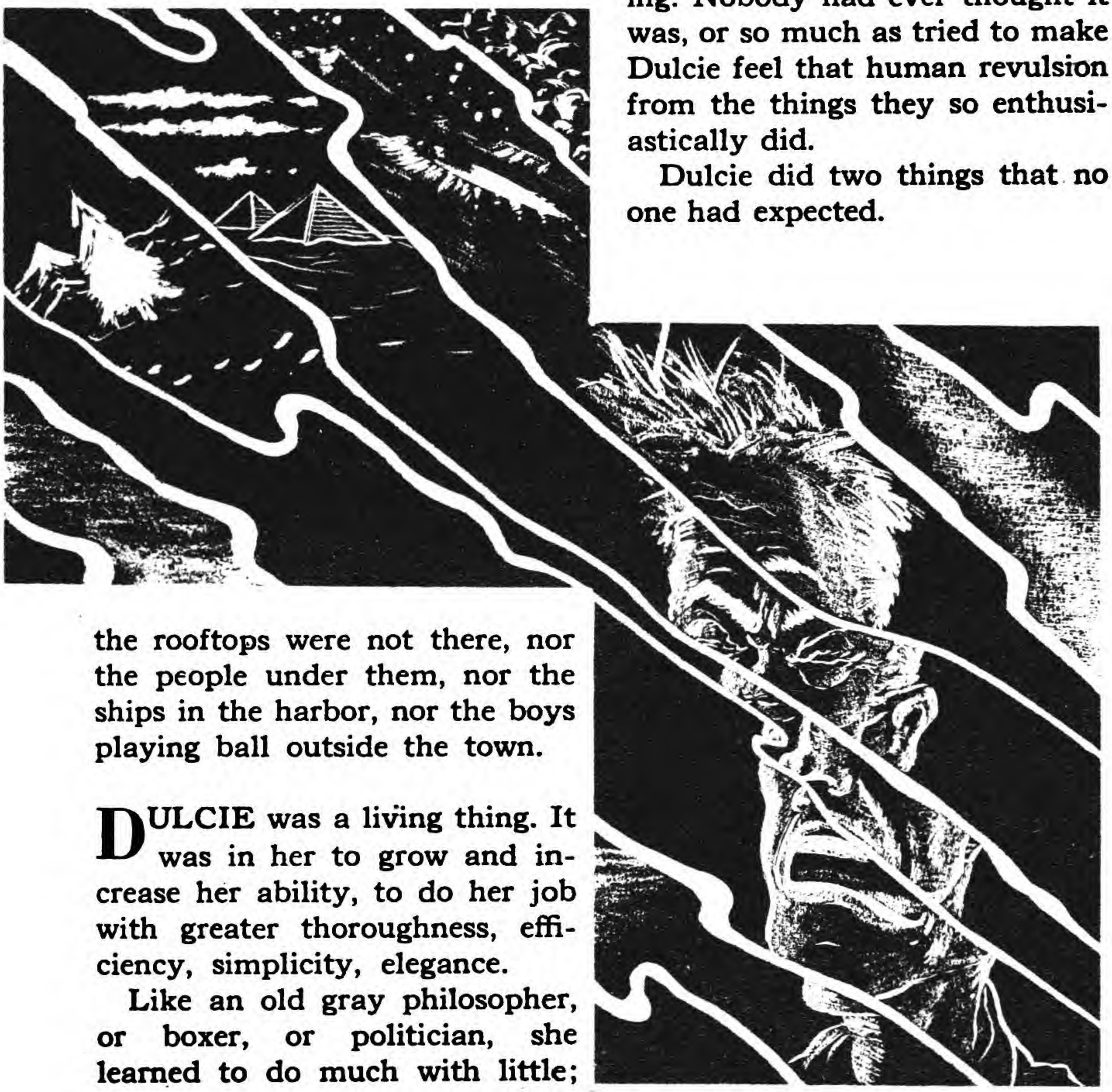
DULCIE was a living thing. It was in her to grow and increase her ability, to do her job with greater thoroughness, efficiency, simplicity, elegance.

Like an old gray philosopher, or boxer, or politician, she learned to do much with little; economy became her passion. She reduced the elements of warfare to a basic few, and reduced them again.

Across the ocean, deep in another continent, so did her enemy.

Now war to a computer is not the same as war to a human being. Nobody had ever thought it was, or so much as tried to make Dulcie feel that human revulsion from the things they so enthusiastically did.

Dulcie did two things that no one had expected.



Probing into the mysteries of the human brain, so convenient and puzzling a model of her own, she found the pattern that could fix a mind forever in one unreasoning conviction. She chose the simplest and best for her purpose: *I love Dulcie.* She insinuated that pattern into the mind of every man, woman and child within her reach—within her hemisphere—and canceled out all the problems of discipline, training, tradition, politics, civil government, military organization, law enforcement—seven-tenths, let's say, of the human picture—at one stroke.

The second thing was even simpler. She deduced the existence of her opponent, searched for him on wavelengths which should be as perceptible to him as to her, and worked out a system of communication.

It was not necessary for men or machines to go to war. DLC could say to DCRM, "I move such a force here." DCRM could reply, "Then I move here."

Not every game had to be played out. When Dulcie lost, she paid. Machines could be destroyed more efficiently by their owner than by the enemy; human beings, asked to die, did it tidily and conveniently. There was no cruelty or humor in it for Dulcie; it simply made her books balance.

And when, in spite of her best fumbling efforts, her human beings—her counters—diminished until none were left, what was she to do but search in the vastness of time for more? She began tentatively, feeling back along the ancestral lines of the last to die, touching here an ancestor more susceptible than the rest, here another—

JONES mumbled something.

"What was that?" Myra asked Kalish. "Did you get it?"

Kalish was carrying some typed papers; the inked notes at the bottom of them, in his own handwriting, were not quite dry. His face had a peculiar expression, a little like that of a man who thinks he has just been wounded, but hasn't felt the pain.

"Latin this time," he said. "*Dulce et decorum est pro patria mori.* 'It is sweet and fitting to die for one's country.'"

The link strained tight. Jones felt his love gathering inside him like a fist: suffocating love, bursting love. He knew it all now. He knew what Dulcie wanted him for and the joy of being chosen was more than he could bear.

His heart burst with it.

"*Click,*" said Dulcie.

"*Click,*" answered Decorum.

And Jones did.

—DAMON KNIGHT

ONE WAY

I thought of every way to save Hal from the Lydna Project and failed . . . but the women didn't!

By MIRIAM ALLEN DEFORD

Illustrated by Irv DOCKTOR

WE had the driver let us off in the central district and took a copter-taxi back to Homefield. There's no disgrace about it, of course; we just didn't feel like having all the neighbors see the big skycar with LYDNA PROJECT painted on its side, and then having them drop in casually to express what they would call interest and we would know to be curiosity.

There are people who boast that their sons and daughters have been picked for Lydna. What is there to boast about? It's pure chance, within limits.

And Hal is our only child and we love him.

Lucy didn't say a word all the way back from saying good-by to him. Lucy and I have been married now for 27 years and I guess I know her about as well as anybody on Earth does. People who don't know her so well think she's cold. But I knew what feelings she was crushing down inside her.

Besides, I wasn't feeling much like talking myself. I was remembering too many things:

Hal at about two, looking up at me—when I would come home dead-tired from a hard day of being chewed at by half a dozen bosses right up to the editor-in-chief whenever anything went the least bit out of kilter—with a smile that made all my tiredness disappear. Hal, when I'd pick him up at school, proudly dis-

playing a Cybernetics Approval Slip (and ignoring the fact that half the other kids had one, too). Hal the day I took him to the Beard Removal Center, certain that he was a man, now that he was old enough for depilation. Hal that morning two weeks ago, setting out to get his Vocational Assignment Certificate . . .

That's when I stopped remembering.

It had been five years after our marriage before they let us start a child: some question about Lucy's uncle and my grandmother. Most parents aren't as old as we are when they get the news and usually have other children left, so it isn't so bad.

WHEN we got home, Lucy still was silent. She took off her scarf and cloak and put them away, and then she pushed the button for dinner without even asking me what I wanted. I noticed, though, that she was ordering all the things I like. We both had the day off, of course, to go and say good-by to Hal—Lucy is a technician at Hydroponics Center.

I felt awkward and clumsy. Her ways are so different from mine; I explode and then it's over—just a sore place where it hurts if I touch it. Lucy never explodes, but I knew the sore place would be there forever, and getting worse instead of better.

We ate dinner in silence, though neither of us felt hungry, and had the table cleared. Then it was nearly 19 o'clock and I had to speak.

"The takeoff will be at 19:10," I said. "Want me to tune in now? Last year, when Mutro was Solar President, he gave a good speech before the kids left."

"Don't turn it on at all!" she said sharply. Then, in a softer voice, she added: "Of course, Frank, turn it on whenever you like. I'll just go to my room and open the soundproofing."

There were still no tears in her eyes.

I thought of a thousand things to say: Don't you want to catch a glimpse of Hal in the crowd going up the ramp? Mightn't they let the kids wave a last farewell to their folks listening and watching in? Mightn't something in the President's speech make us feel a little better?

But I heard myself saying, "Never mind, Lucy. Don't go. I'll leave the thing off."

I didn't want to be alone. I wanted Lucy there with me.

So we sat out the whole time of the visicast, side by side on the window-couch, holding hands. I'll say this for the neighbors—they must all have known, for Hal was the first to be selected from Homefield in nearly 40

years, and the newscast must have announced it over and over! but not a single person on the whole 62 floors of the house butted in on us. Not even that snoopy student from Venus in 47-14, who's always dropping in on other tenants and taking notes on "the mores of Earth Aboriginals." People can be very decent sometimes. We needn't have worried about coming home in the Lydna Project bus.

It was no good trying to keep my mind on anything else. Whether I wanted to or not, I had to relive the two last hours we'd ever have with Hal.

It couldn't mean to him what it meant to us. We were losing; he was both losing and gaining. We were losing our whole lives for 21 years past; he was, too, but he was entering a new life we would never know anything about. No word ever comes from Lydna; that's part of the project. Nobody even knows where it is for sure, though it's supposed to be one of the outer asteroids.

Both boys and girls are sent and there must be marriages and children—though probably the death-rate is pretty high, for every year they have to select 200 more from Earth to keep the population balanced. We would never know if our son married there, or whom, or when he died. We would never see our grandchildren, or even know if we had any.

HAL was a good son and I think we were fairly good parents and had made his childhood happy. But at 21, faced with a great, mysterious adventure and an unknown and exciting future, a boy can't be expected to be drowned in grief at saying good-by to his humdrum old father and mother. It might have been tougher for him 200 years ago, when they hadn't learned to decondition children early from parental fixations. But no youngster today would possess that kind of unwholesome dependency. If he did, he would never have been selected for Lydna in the first place.

That's one comfort we have—it's a sort of proof we had reared a child far above the average.

It was just weakness in me to half wish that Hal hadn't been so healthy, so handsome, so intelligent, so fine in character.

They were a wonderful lot. We said our good-bys in an enormous room of the spaceport, with this year's 200 selectees there from all over Earth, each with the relatives and whoever else had permission to make the last visit. I suppose it's a matter of accommodations and transportation, for nobody's allowed more than three. So it was mostly

parents, with a few brothers, sisters and sweethearts or friends. The selectees themselves choose the names. After all, they've had two weeks after they were notified to say good-by to everyone else who matters to them.

Most of the time, all I could keep my mind on was Hal, trying to fix forever in my memory every last detail of him. We have dozens of sound stereos, of course, but this was the last time.

Still, it's my business at the News Office, and has been for 30 years, to observe people and form conclusions about them, so I couldn't help noticing with a professional eye some of the rest of the selectees. (This farewell visit is a private affair, and the press is barred, which is why I'd never been there before.)

There were two kinds of selectees that stood out, in my mind. One was those who had nobody at all to see them off. Completely alone, poor kids—orphans, doubtless, with no families and apparently not even friends near enough to matter. But, in a way, they would be the happiest; life on Earth couldn't have been very rewarding for them, and on Lydna they might find companionship. (If only companionship in misery, I thought—but I shied away from that. In our business, there are always leaks; we know—or guess—a few things about Lydna nobody else does, outside the authorities themselves. But we keep our mouths shut.)

The ones that tore my hearts were the boys and girls in love. They never take married people for Lydna, but a machine can't tell what a boy or girl is feeling about another girl or boy, and it's a machine that does the selecting. There's no use putting up an argument, for, once made, the choice is inexorable and unchangeable. In my work as a newsgatherer, I've heard some terrible stories. There have been suicide pacts and murders.

YOU could tell the couples in love. Not that there were any scenes. If there had been any in the two weeks past, they were over. But anybody who has learned to read human reactions, as I have, could recognize the agony those youngsters were going through.

I felt a deep gratitude that Hal wasn't one of them. He'd had his share of adolescent affairs, of course, but I was sure he was still just playing around. He'd seen a lot of Bet Milen, a girl a class ahead of him in school and college, but I didn't think she meant more to him than any of the others. If she had, she'd have been along to say good-by, but he'd asked for only the two of us. She was now a laboratory

assistant in our hospital and could easily have gotten the time off.

It was growing late, almost midnight, and Lucy and I had to be at work tomorrow, no matter how we felt. I forced myself to talk, with Lucy's silent pain smothering me like a force-blanket. I made an effort and cleared my throat.

"Lucy, go to bed and turn on the hypno and try to get some sleep."

Lucy stood up obediently, but she shook her head. "You go, dear," she said, her voice firm. "I can't. I—"

The roof buzzer sounded. Somebody had landed in a copter and wanted us.

"Don't answer," I said quickly. "There's nobody we want to see—"

But she had already pushed the button to open the door.

It was Bet Milen, the girl Hal used to go around with..

I braced myself. This might be bad. She might have cared more for Hal than we had guessed.

But she didn't look grief-stricken. She looked excited, and determined, and a little bit frightened.

She scarcely glanced at me. She went right up to Lucy and took both Lucy's hands in hers.

"Well," she said in a clipped, tense voice, "we made it."

Then Lucy broke for the first time. The tears ran down her face and she didn't even wipe them away. "Are you *certain?*"

"Positive. And I got word to him. We'd agreed on a code. That's why he didn't want me there today—we couldn't trust ourselves not to betray it, either way."

I stood there staring at them, bewildered.

"What's this all about?" I demanded. "Have you two cooked up some crazy scheme to rescue Hal? I hope to heaven not! It would ruin all of us, including him!"

THE wild daydreams I'd had myself flashed through my mind—the drug that would seem to kill him and wouldn't, the anonymous false accusation of subversion, the previous secret marriage. All impossible, all fatal.

Lucy disengaged her hands from the girl's and slipped her arm through mine.

"You tell him, Bet," she said gently. "You're the one who should."

I'd never noticed how pretty the girl was till then, when she stood there with her face flushed and her eyes straight on mine. A pang went through me; if only she and Hal could have—

"No, Mr. Sturt," she said, "we

haven't rescued Hal. He's gone. But we've rescued part of him. I'm going to have his baby."

"Bet's going to live with us and be our daughter, Frank," Lucy explained. "Hal and she and I worked it out in these two weeks, after they came to me and told me how they felt about each other. We couldn't tell you till we were sure; I couldn't bear to have you hope and then be disappointed—it would be enough for me to have to suffer that."

"That is, I'll come if you want me here, Mr. Sturt," said Bet.

I had to sit down before I could speak. "Of course I want you. But what about your own family?"

"I haven't any. My mother's dead and my father's an engineer on Ganymede and gets home on leave about once in three years. I've been living in a youth hostel."

"But look here—" I turned to Lucy— "how on Earth can you know? Two weeks or less is no time—"

Lucy gave me a look I recognized, the patient one of the scientist for the layman.

"The Chow-Visalius test, dear. One day after the fertilized ovum starts dividing—"

"And I ran it myself every day for over a week. That's one of my jobs in the lab and it was easy to slip in another specimen. And it didn't, and it didn't and I went nearly out of my mind—"

"Every time Hal entered the apartment, I'd look at him and he'd shake his head," Lucy interrupted. "It meant everything to him. And it would just have broken my heart—"

"Mine, too," Bet said softly. "And his. And today was the last chance. I was scared to try it. This afternoon at 14:30, just before the farewell visits, was the deadline for viz messages to any of them. If I'd had to send mine without the word we'd agreed on that would tell him it was all right— But it was, at last! And now he knows, even if I never—even if we never— Excuse me, please, it's been a strain. I'm afraid I'm going to bawl."

WE let her alone. Kids nowadays hate to be fussed over.

Us, we'd lost our son, and that was going to stay with us forever. But now we would have his child to love and—

An appalling thought struck me suddenly. I can't imagine why I hadn't realized it sooner. All this emotion, I suppose.

"Good God!" I cried. "An illegal child! We can't keep it!"

"Nobody's going to know," Lucy replied calmly. "Bet's going to live with us, and when it starts to show, she's going to take her allowed leave. We'll take ours,

too, and we'll all go on a trip—to Mars, maybe, or Venus—one of the settled colonies where we can rent a house. Babies don't *have* to be born in hospitals, you know; our ancestors had them right at home. She's strong and healthy and I know what to do. Then we'll come back here and we'll have a baby with us that we adopted wherever we were. Nobody will ever know."

"Look," I said in a voice I tried to keep from rising. "There are four billion people on Earth and about 28 billion in the colonized Solar planets. Every one of those people is on record at Central Cybernetics. How do you suppose you're going to get away with the phony adoption of a non-existent child? The first time you have to take it to a baby clinic, they'll find it has no card."

"I thought of that," Lucy said, "and it can be done, because it must. Frank, for heaven's sake, use your wits! You're a newsgatherer. You know all sorts of people everywhere."

"I don't know any machines. And it's machines that handle the records."

"Machines under the supervision of humans."

"Sure," I said sarcastically. "I just go to my ex-newsgatherer pal who feeds the records to Io or Ceres and say, 'Look, old fellow, do me a favor, will you? My wife wants to adopt a baby from your colony, so just make up the names of two people and give them a life-check, invent their ancestors back to the time Central Cybernetics was established, and then slip in cards for their marriage, and the birth of their child—I'll let you know later whether to make it a boy or a girl—and then their deaths; and then my wife and I can adopt that made-up baby.'

"What kind of blackmailing hold do you think I have on any record official," I asked angrily, "to make him do a thing like that and keep his mouth shut about it? I could be eliminated for treason for even making such a suggestion."

"Frank, *think!* Surely there must be *some* way!"

AND then it struck me. "Wait! I just got an idea. When I said 'treason,' just now— It might barely be possible—"

"Oh, what?"

"It would have to be Mars, the North Polar Cap colony. The K-Alph Conspiracy messed things up there badly."

"I remember, Mr. Sturt!" Bet said excitedly. "They wrecked everything in the three months before the rebellion was crushed, didn't they?"

"Everything including their cybernetics equipment. Central

doesn't want it known, but I have inside information that it's still not in going condition. That colony is full of children who have never been registered. And I doubt if it will be in 100 per cent shape for the best part of another year. Those hellions really did a job. Let's see—this is the end of Month Two. We'd have to get away around Month Eight at the latest and the baby would be born —when exactly, Bet?"

"Early in Month Twelve. We could all be back here again by the first of next year, or even by the end of Month Thirteen."

"Well, I have enough accumulated leave for that and I guess you have too, Lucy; neither of us has taken more than two or three weeks for years. But what about you, Bet? You've been working less than a year."

"I can borrow it. Our director is crazy about travel and she'll be all for it when I tell her I have a chance to go to Mars for a long visit. Besides, she knows about Hal and me—I mean the way we are about each other—and she'll understand that I'd want to get away for a while now."

Asher, my editor-in-chief, would feel the same way, I thought, and so would Lucy's boss.

"I knew you'd find a way," remarked my wife complacently.

I looked at the telechron.

"We've all got to be at work in seven hours," I said, "if we expect to get through before the end of the afternoon. What say we turn in?"

"You stay here with us, Bet," said Lucy. "You parked your copter in our port, didn't you? Frank, I think we need a drink."

I pushed the buttons. Nobody said anything, but somehow it was a toast to Hal. I know the liquor had to get past a lump in my throat and the women were both crying. It wasn't like my self-contained Lucy. I guess she thought so herself, for she braced herself. But her voice was still trembling when she turned to Bet.

"A year from now," she said, "we'll all be back here in this room and, this time, part of Hal will be here with us—his son, our little Hal."

"It might be our little Hallie." Bet smiled through her tears. "It will be ten weeks before I can run the Schuster test to find out."

"It won't make any difference. Hal will never know that, but he'll know, way out there on Lydna, that his baby has been born. He'll know, even though he can never see it—or us."

LUCY blinked, then went on bravely. "Every time he looks in a mirror there, he'll say to him-

self, 'Well, back on Earth, there's a little tyke with my blue eyes and my curly hair and my mouth and nose and chin, who's going to grow up to be tall and straight like me—or maybe like Bet, but also a lot like me.'

"And as he grows older, he can think back to the way he was as a child and a boy and a man, and know that his son, or his daughter, will be feeling and thinking and looking some day just about the way he himself is then, and it will be a link with Earth and with us—"

That was when I had to go to the window and look out for a long time to pull myself together before I could face them again.

Lydna is top-top secret, but as I've said before, we newsgatherers get inside information.

I have a pretty shrewd idea of what the mysterious Lydna Project is. It's to alter human beings so they can adapt to the colonization of outer space.

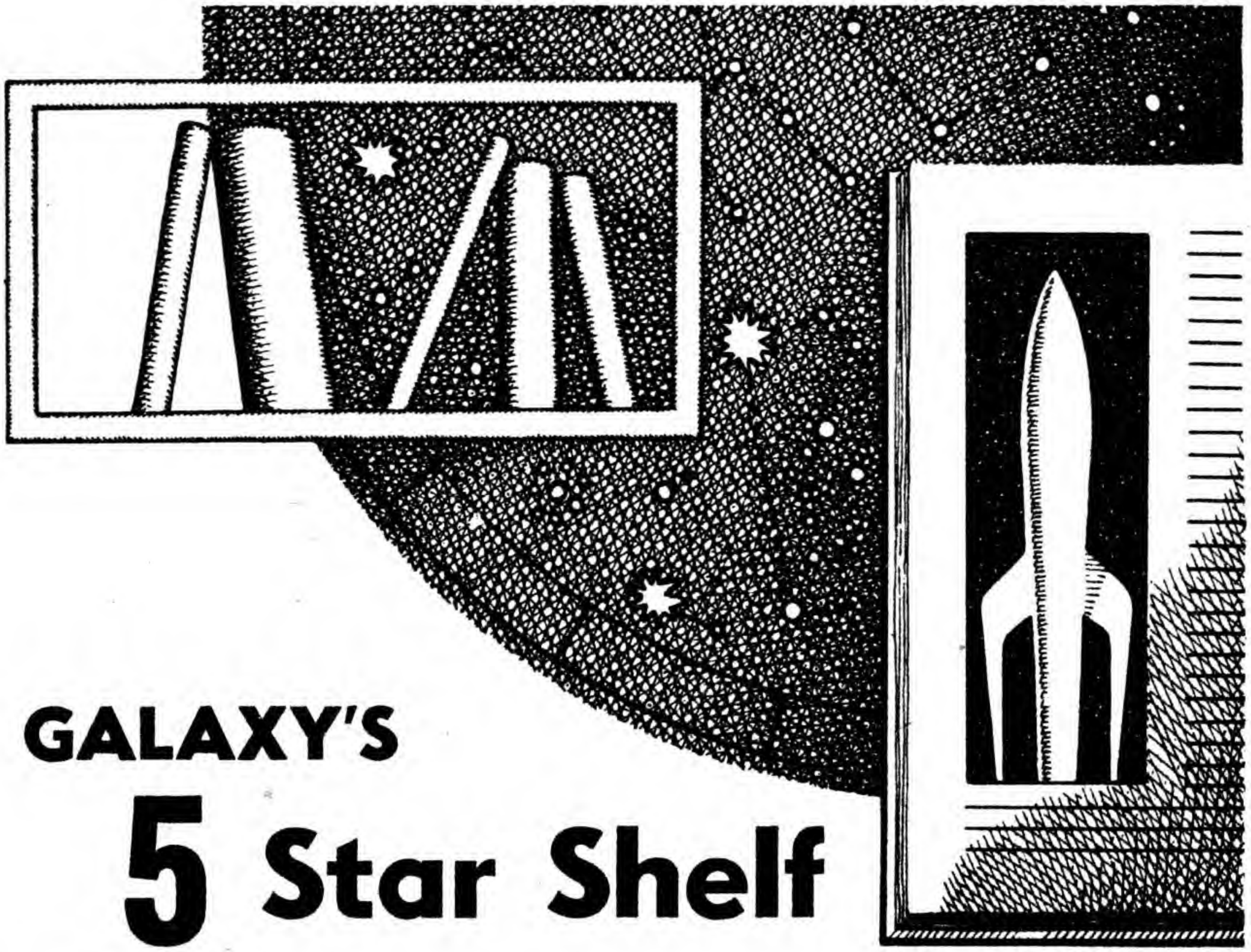
The medics do things to them to enable them and their descendants to resist every possible condition of temperature and radiation and gravity. They have to alter the genes—acquired characters would be of use only in a short-term project, and this is long-term. But you can't alter genes without affecting the individual.

We'd have Hal's normal child.

But when Hal got to Lydna, he and the rest of them would be shocked and sick for a while at sight of some of the inhabitants. And if he had any children on Lydna, we, back here, would scarcely recognize them as human. Some of them might have extra limbs. Some might have eyes and ears in odd places. Some might have lungs outside their bodies, or brains without a skull.

By that time, Hal himself would have got over being sick—unless, some time, he got hold of a mirror and remembered the boy he used to be.

—MIRIAM ALLEN deFORD



GALAXY'S 5 Star Shelf

SATELLITE ONE by Jeffery Lloyd Castle. Dodd Mead & Co., **$3.00**

WHEN I first began reading this book, I said to myself, "*Ochone!* Another one of those stuffy British jobs!" But when I finally laid it down, I said—out loud this time—"*Eureka*! The best novel on the first space station yet to appear!"

The moral: don't always let your momentary distaste for a writing style deter you from further reading. This book opens with a pretty pompous introductory chapter, but once you get by that, you are into a genuinely enthralling account of the planning, building, launching, and (in space) continuous enlargement of the first "Earth satellite vehicle."

Like Arthur Clarke's rocket in his *Prelude to Space,* this project is primarily a British one, though there are many scientists of other nationalities involved, too. Indeed, the book is a fine parallel—and extension—of the Clarke tale. As in that book, the rocket is launched in Australia and (also as with the Clarke) there are no

nasty saboteurs and international spies, no lurid violence, no cheap melodrama—just a fine story.

And there is some wonderful descriptive writing as well. Mr. Castle's pictures of life and work on the satellite in space are without doubt the most real and almost poetically vivid I have ever read. Indeed, the whole book, once you get by the opening few pages, is tomorrow's history given solid flesh and bones.

TO WALK THE NIGHT by William Sloane. Dodd, Mead & Co., $2.75

THIS novel, which was first published in 1937, is definitely worth reissue. It is a subtle, moving story of mood and character, written in the great tradition of British fantasy, even though the author is an American.

It tells of the extraordinary short life of the lovely and mysterious Selena LeNormand and her tragic interludes with two men, old Professor LeNormand and brilliant young mathematician Jerry Lister. Particularly fascinating is the quietly frightening way in which the author plays the ancient theme of "possession" on the new instrument of science fiction.

SCIENCE AND CIVILIZATION IN CHINA, VOL. I, by Joseph Needham. Cambridge University Press, $10.00

DID you know the Chinese were the first inventors not only of gunpowder and printing, but of wheelbarrows, cast iron, canal-lock gates, suspension bridges, etc., and discoverers of magnetic polarity, the science of musical acoustics, and so on?

Did you know that, in the 15th century, the Chinese published an encyclopedia that ran to the incredible total of 11,095 volumes?

Did you know that the Chinese developed, a thousand or more years ago, "an organic philosophy of nature, closely resembling that which modern science has been forced to adopt after three centuries of mechanical materialism," as Needham puts it?

The answer is, of course, that most of us know nothing about the ancient civilizations of the great Asiatic peoples. Here, in what James R. Newman, in his review in *Scientific American*, characterizes as "a landmark of intellectual history," is the first of a series of seven volumes by Needham which, when all are published, will present for the first time a coherent and organized picture of the scientific and technological—and philosophical—achievements of one of our

greatest and least known societies.

The present volume, produced with a taste and beauty that thoroughly measure up to the importance of its subject, sets the background for the volumes to come. In sections on Chinese language, geography, history and "Conditions of Travel of Scientific Ideas and Techniques Between China and Europe," the author presents a richly patterned tapestry of the development of civilization in the Far East.

The book is *not* a popularization; it does not "read like a novel;" it is a true work of scholarship. Yet I believe that any reader whose interests rise above the level of popular fiction will find the book and its subsequent volumes completely fascinating. It is for everyone who is intrigued by the unknown, whether future (science fiction) or past (scientific history).

ANGELS AND SPACESHIPS by Fredric Brown. E. P. Dutton & Co., Inc., $2.75

HERE is a perfectly delightful book. Fred Brown has collected eight of his very best stories, and has written especially for this book nine short-shorts that have all the perfection of little diamonds, each polished with a keen cutting edge.

"Etaoin Shrdlu" and "The Waveries" are my favorites among the longer stories, "Politeness" and "Reconciliation" among the short-shorts; but actually there is not a story included that isn't Class A, with the possible exception of the last item, a 2-pager called "Solipsist," which I thought a bit portentous.

The book's a lovely job—and nicely designed and produced, for a change, too.

OPERATION OUTER SPACE by Murray Leinster. Fantasy Press, $3.00

THE indefatigable Leinster! This is his fourth 1954 novel —and another 1954 item is on hand for review next month, too! What a man!

The current tale, which has never been serialized, takes an entirely new look at faster-than-light travel to the stars: a fast-paced, sardonic job that is primarily a satire on the future of mass communications.

Fella discovers faster-than-light communications technique. TV producer says, "Why not physical objects, too?" Filthy rich neurotic buys "fame-rights" to the invention. Luxurious spaceship built as giant hoax to hook investors in a non-existent

expedition to Mars (the Moon is already colonized) becomes the first, almost involuntary faster-than-light vessel, with as screwy a crew as has ever been cooked up (including the inevitable and delightful Leinster heroine), and the whole jaunt to the stars is turned into raw material for the TV producer's regular "space opera" show—with commercials—and *what* commercials!

It's a jolly tale indeed.

CHILDREN OF THE LENS by Edward E. Smith. Fantasy Press, $3.00

WITH this, the sixth and possibly last in the Smith space saga, I have a chance to re-evaluate the whole series. Frankly, I suspect I've been a bit too rough in my previous reviews. Sure, it's space opera undiluted. Sure, it's written in a style varying from the irritating to the infantile. Sure, its characters aren't much more than cardboard cutouts.

Even so, you can't escape the fact that the work has appeal. It *moves*! And I believe this new and final (?) addition to the series is the best of the lot, too.

My early complaints are still valid: impossible weapons, ridiculous mental powers, a complete disregard for the laws of Nature. But consider the series as a sort of overblown fairy tale for modern juveniles, with magic "science" substituted for mere magic, and I think we have in the Lensman series a pretty solid achievement.

A BUDGET OF PARADOXES by Augustus De Morgan. Dover Publications, Inc., $4.95

WHAT Sprague de Camp did for the "lost continent" crackpots in his book by that name (GALAXY, Sept. 1954), De Morgan almost does for the perpetual motion boys, the "quadrature" fanatics (squarers of the circle), "the quixotic opponents of Newton's physics, the axe-grinders who use mathematics as a means of bolstering religious creeds," and innumerable other oddities, far from all of them mathematical.

In this huge book (over 800 pages), which was first published in 1872 and competently edited by an American scholar in 1915, the British author collected literally hundreds of examples of the "debris of barren intellectual labor," as Prof. Ernest Nagel puts it in his introduction to the current reprint, that have been spewed forth through the ages.

Unfortunately the book is rather hard going because of the gnarled crochets of the author's style and the total absence of or-

der or arrangement of the material. The latter is not always a defect, though, since it does mean you're constantly meeting new oddities. A section "On Inhabitable Planets," for example, a wonderful doggerel entitled "The Astronomer's Drinking Song," a hot controversy on decimal coinage, and so forth.

For anyone who is interested in seeing how goofy the human animal can get in the world of science, this monstrous melange will prove an endless joy.

THE STAR BEAST by Robert A. Heinlein. Charles Scribner's Sons, $2.50

NOBODY but nobody can beat Heinlein in the writing of teen-age science fiction. I say teen-age, since the publisher so classifies R.A.H.'s Scribner series, of which this is the eighth, but the present tale was serialized in the *Magazine of Fantasy and Science Fiction, which either* makes the story adult or makes all readers of F&SF (and GALAXY, too!) perennal juveniles. So what? I sort of like the idea myself!

This is Heinlein's first "alien invasion" tale for Scribner's; the others have been space opera. Small fry of crocodile type was brought to Earth from a distant star as a pet a few generations before the story opens. When we meet it, it has grown to be about the size of a locomotive. It's very intelligent, too, though no one knows that except the two youngsters who are its masters.

The adventures they go through in keeping Lummox—the book was serialized under the title *Star Lummox*—alive make up one of Heinlein's most enchanting tales.

THE BEST SCIENCE FICTION SHORT STORIES, 1954, *edited by Everett F. Bleiler and T. E. Dikty. Frederick Fell, Inc.,* $3.50

BY far the best part of this sixth volume in the series of Bleiler-Dikty annuals is the perceptive introduction by Fritz Leiber, who also has two stories in the book. This introduction calls attention to parallels between science fiction and the great themes of ancient legend, which he calls "Icons of Man's Imagination."

Of the 13 tales in the collection, five have already appeared elsewhere in hard covers. Eight of the stories, I class as B-plus or better; five as average or below. It is certainly not the "best" of the 1953 output by a long shot, but it does contain *some* of the year's best.

—GROFF CONKLIN

No man could make the Long Haul alone and so there had to be somebody behind the bulkhead —but the enormously important question was:

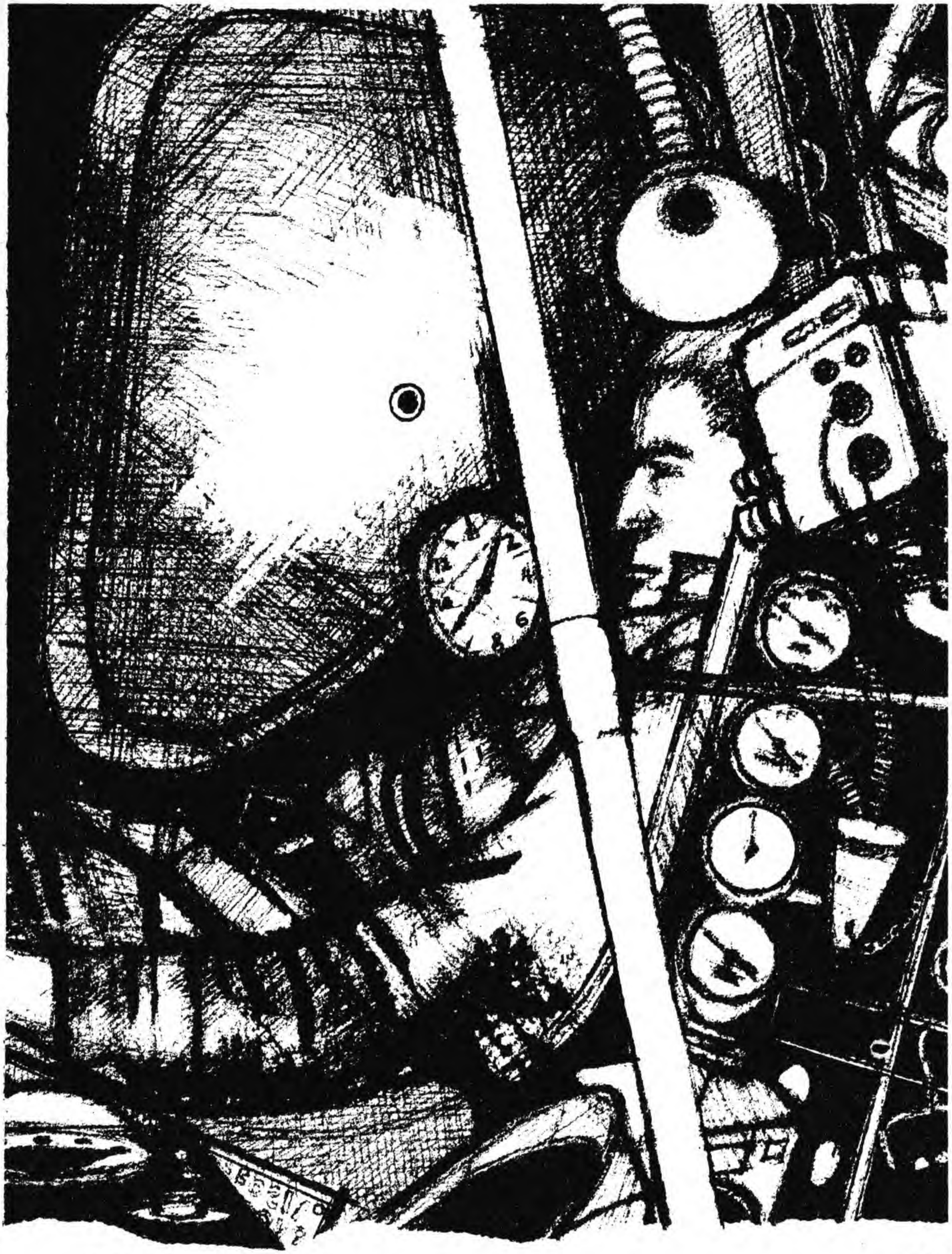
WHO?

By THEODORE STURGEON

YOU just don't look through viewports very often.

It's terrifying at first, of course—all that spangled blackness and the sense of disorientation. Your guts never get used to sustained free-fall and you feel, when you look out, that every direction is *up*, which is unnatural, or that every direction is *down*, which is sheer horror. But you don't stop looking out there be-

Illustrated by ASHMAN



cause it's terrifying. You stop because nothing ever happens out there. You've no sensation of speed.

You're not going anywhere.

After the weeks and months, there's some change, sure; but from day to day, you can't see the difference, so after a while you stop looking for any.

Naturally, that eliminates the viewports as an amusement device, which is too bad. There aren't so many things for a man to do during a Long Haul that he can afford to eliminate anything.

Getting bored with the infinities outside is only a reminder that the same could happen with your writing materials, and the music, the stereo and all the rest of it.

And it's hard to gripe, to say, "Why don't they install a such-and-such on these barrels?" because you've already got what a thousand spacemen griped about long since—many of them men with more experience, more imagination and less internal resources (that is to say, more need) than you'll ever have. Certainly more than you have now; this is your first trip and you're just making the transition from "inside looking out" to "inside looking on."

It's a small world. It *better* be a little complicated.

A LOT that has happened in worlds like these would be simple to understand, if you knew about it. Not knowing is better, though; it keeps you wondering. Some of it you can figure out, knowing as you do that a lot of men have died in these things, a lot have disappeared, ship and all, and some (but you don't know how many) have been taken out of the ships and straight to the laughing academy.

You find out fairly soon, for example, that the manual controls are automaticaly relayed out, and stay out of temptation until you need them to land. (Whether they'll switch in if you need them for evasive maneuvering some time, you don't know yet.) Who died—how many died—because they started playing with the manual controls? And was it because they decided to quit and go home? Or because they convinced themselves that the auto-astrogator had bugs in it? Or because they just couldn't stand all those stationary stars?

Then there's this: You're alone. You have a shipmate, but even so, you're alone. You crouch in this little cell in the nose of your ship, with the curving hull to your left and the flat wall of the midship bulkhead to your right. Because it's there, that bulkhead, you know that in previous models it wasn't. You can imagine what

happened in some (how many?) ships to make it necessary to seal you away from your shipmate.

Psychodynamics has come a long way, but you called this a world; well, reduce a world to two separate nations and see what happens. Between two confined entities, there's no mean and no median, and no real way of determining a majority. How many battered pilots have come home crazed, cooped up with the shredded bodies of their shipmates?

So that's easy to understand—you can't trust two human beings together. Not for long enough. If you don't believe it, look at the bulkhead. It's there because it *has* to be there.

Being a peaceable guy, it scares you a little to know how dangerous you are.

Makes you a little proud, though, doesn't it?

Be proud of this, too—that they trust you to be alone so much. Sure, there *is* a shipmate; but by and large you're alone, and that's what's expected of you. What most people, especially Earthside people, never find out is that a man who can't be by himself is a man who knows, away down deep, that he's not good company. You could probably make it by yourself altogether . . . but you must admit you're glad you don't have to. You have access to the other side of the bulkhead, when you need it. If you need it. It didn't take you too long to figure out you'd use it sparingly.

You have books and you have games, you have pictures and text tapes and nine different euphorics (with a watchdog dispenser, so you can never become an addict) all of which help you, when you need help, to explore yourself. But having another human mind to explore is a wonderful idea—a wonder tempered by the knowledge—oh, how smart you were to figure it out in time!—that the other mind is a last resort. If you ever use up the potentialities it holds for you, you're through, brother!

So you have endurance contests with yourself to see how long you can leave that bulkhead alone.

YOU go back over your life, the things you've done. People have written whole novels about 24 hours in a man's life. That's the way you think it all out, slowly, piece by piece; every feature of every face and the way they were used; what people did and why. Especially why. It doesn't take any time to remember what a man did, but you can spend hours in thinking about why he did it.

You live it again and it's like being a little god, knowing what's

going to happen to everyone.

When you reported to Base, there was a busload of guys with you. Now you know who would go all the way through the course and wind up out here; reliving it, you can put yourself back in the bus again and say, "That stranger across the aisle is Pegg. He isn't going to make it. He'll go home on furlough three months from now and he'll try to kill himself rather than come back. The freckled nape in the seat ahead of you belongs to the redhead Walkinok, who will throw his weight around during the first week and pay expensively for it afterward. But he'll make it."

You make friends with the shy dark guy next to you. His name is Stein and he looks like a big-brain. He's easy to talk to and smart, the kind of fellow who always goes straight to the top. And he won't last even until the first furlough; two weeks is all he can take, and you never see him again. But you remember his name. You remember everything and you go back over it and remember the memories in between the memories. Did somebody on that bus have shoes that squeaked? Back you go and hunt for it. If it happened, you'll remember it.

They say anyone can recall this way; but for you, with what the psycho-dynamicians have done to you—or is it *for* you?—you can do more of this than anybody. There isn't anything that ever happened in your whole life that you can't remember. You can start at the beginning and go all the way through. You can start at the beginning and jump years in a second and go through an episode again . . . get mad again . . . fall in love again.

And when you get tired of the events themselves, you can run them off again, to find out why. Why did Stein go through those years of study and preparation, those months of competition, when all the time he didn't *want* to be in the Space Service? Why did Pegg conceal from himself that he wasn't fit for the Space Service?

SO you cast back, comb, compare and ponder, keeping busy. If you're careful, just remembering lasts a long time, wondering why lasts even longer; and in between times, there are the books and stereos, the autochess and the music . . . until you're ready to cast and comb in your memories again. But sooner or later—later, if you're especially careful—you'll get restless and your life as it was played out, and the reasons why it was played just that way, all that

gets old. You can think of no new approach to any of it and learn nothing more from it.

That's where the centerline bulkhead comes in handy. Its very shape is a friendly thing to you; the hull on your left is curved, being part of the ship's side, but the bulkhead is a flat wall. Its constant presence is a reminder that it has a function, like everything else in your world; that it is, by nature, a partition; that the existence of a partition presupposes another compartment; and that the other compartment is the size and shape of this one and designed for a similar purpose—to be a dwelling for someone.

With no sound nor sign of occupancy, the bulkhead still attests the life behind it, just by being there. It's a friendly flatness, a companionable feature of your world, and its company pervades all your thinking.

You know it's your last resort, but you know, too, that it's a rich one, and when at last you're driven to use it, you'll enter another kind of world, more complex and more engrossing than your own, just for the work it takes to get from place to place and the mystery of the fog between the places. It's a mind, another human mind, sharing this prison with you when at last you need sharing more than anything whatever in all of space.

Who is it?

You think about that. You think a whole lot about that. Back at Base, in your last year, you and the other cadets thought about that more than anything. If they'd ever given you the shadow of a hint . . . but no; wondering about it was apparently part of your training. You knew only that on your Long Haul, you would not be alone. You had a pretty good idea that the choice of a shipmate for you would be a surprise.

You looked around you at mess, in class, in the dormitory; you lay awake at night dealing out their faces in a sort of solitaire game; and sometimes you thought about one and said, "That'd be fine. We'd get along." And sometimes you said, "That stinker? Lock me up with *him* and that bulkhead won't be tough enough. I'll kill him after the third day, so help me!"

And after they tapped you for your first Haul, this was the only thing you were scared about—who'd be your shipmate. Everything else, you thought you could handle. You knew your job inside out and backward and it wouldn't whip you. You were sharp-tuned, fine-honed, ready for anything that was under your own control. You were even confident about being alone; it

wouldn't get you. Not a chance.

Away down deep, no man believes he can be driven out of his mind, just as he cannot believe—really believe—that he will be dead. That's the kind of thing that happens to someone else.

BUT this business of a shipmate—this wasn't under your control. You didn't control who it would be and you wouldn't control the guy after blastoff. It was the only unknown and therefore the only thing that scared you.

Amendment: there was a certain amount of control. The intercom button was on your side of the bulkhead. Leave it alone and you didn't have to so much as know you had a shipmate until you were good and ready.

Being able to shut off a voice isn't control, though. You don't know what your shipmate will do. Or *be*.

In those last tight days before blastoff, there was one thing you became overwhelmingly aware of. *Esprit de corps*, they call it. You and the other graduates were hammered into a mold—and hammered some more until the resiliency was gone out of you. You were alike and you did things alike because you had grown to want to. You knew for certain that one of this tight, trustworthy little group would be picked for you; their training and yours, their whole lives and yours, pointed toward this ship, this Haul.

Your presence on this ship summed up your training; your training culminated in your presence on the ship. Only a graduate cadet was fit to man the ship; the ship existed solely for the graduate cadet. This was something so self-evident that you never thought about it.

Not until now.

Because now, a few minutes ago, you were ready to push that button. You couldn't know if you'd broken all records for loneliness, for duration of solitary confinement, but you'd tried. You'd looked through the viewport until it ceased to mean anything. You'd read until you didn't care any more. You'd lived the almost-life of the stereos until you couldn't make believe you believed them. You'd listened to music until it didn't matter. And you'd gone over and over your life from its very beginnings until you'd completely lost perspective on it or anything and anyone in it.

You'd found that you could go back to the viewport and cycle through the whole thing again, but you'd done that, too, so often that the whole matrix of personal involvement was emptied out. Then the flatness of the

bulkhead made itself felt. In a way, it seemed to bulge toward you, crowd you against the ship's side, and you knew it was getting to be time you pushed that button and found out for sure.

Who?

PETE or Krakow or that crazy redhead Walkinok? Or Wendover (you all called him Bendover) with all those incomprehensible shaggy-dog stories? Harris? Beerbelly Flacker or Cohen the Wire-haired Terror? Or Shank (what you all called him was a shame)? Or Gindes, whose inexplicable nickname was Mickey Mouse? You'd sort of hoped it would be Gindes, not because you liked him, but more because he was the one classmate you'd never known very well. He always used to look on and keep his mouth shut. He'd be much more fun to explore than, say, old Shank, who was so predictable that you could practically talk in chorus with him.

So you've tortured yourself, just for the sake of torture, with your thumb over the intercom button, until even the torture dried out and blew away.

You pushed.

You found out, first of all, that the intercom apparently had its own amplifier, energized when you held the button down, and that it took forever—well, three or four seconds, anyway—to warm up. First nothing, then a carrier, then the beginning of a signal; then, at last, the voice of your shipmate, rushing up to full volume, as loud and as clear as if the bulkhead did not exist. And you get off that button as if it had turned into a needle; and you're backed against the outboard bulkhead, deep in shock, physically in silence, but with that voice going on and on and on unbelievably in your unbelieving brain.

It was crying.

It wept wearily, as though you had tuned in toward the end of a long session of wild and lonesome grief. It cried quietly, exhaustedly, without hope. And it cried in a voice that was joltingly wrong for this place—a light, high voice, nearly a contralto. It was wrong, altogether wrong.

The wild ideas come first: *Stowaway?*

You almost laugh. For days before blastoff, you were drugged and immersed in high-frequency fields; hypnotized, worked and reworked mentally and physically. You were passively fed and passively instructed.

You don't know now and you may never know all they did to you. But you can be sure it was done inside six concentric rings of "security" of one kind and another, and you can be sure that

your shipmate got the same. What it amounted to was concentrated *attention* from a mob of specialists, every sleeping and waking second from the time you beered it up at the class farewell dinner to the time the accelerator tug lifted your ship and carried it screaming up and outward. Nobody was in this ship but those who belonged in it; that you can absolutely bank on.

Mad idea, the second. For a while, you don't even dare think it, but with that kind of voice, that crying, you have to think of something. So you do and you're scared, scared in a way you've never imagined before, and to a degree you didn't think was possible. *There's a girl in there!*

YOU run those wordless syllables, those tired sobs, through your mind again, seeking for vocalizations as separated from the breathy, painful gasping that accompanied them. And you don't know. You just can't be certain.

So punch the button again. Listen some more.

Or *ask*.

But you can't. The crazy idea might be true and you couldn't stand that. They couldn't—they just couldn't—put a girl on these ships with you and then stow her behind the bulkhead.

Then you have an instant fantasy about that. You kneel (bumping your skull on the cover) and feel frantically around the bulkhead, where it meets deck-plates, nose compartment, overhead, after-bulkhead; and all around your fingers ride the bead of a weld. You sit back, sweating a little and half-laughing at yourself. Scratch off one fantasy; there'll be no sliding partitions into any harems this trip.

You stop laughing and think, "They couldn't be that *cruel!*" You're on a test run, sure, and it isn't the ship that's being tested. You know that and you accept it. But tests, tests . . . must you throw a glass vase on a brick sidewalk to find out if it's brittle? You see one of your own hands going up and out to check for a panel, a joint again. You sneer at it, at your own hand, and watch it stop in embarrassment.

Well, say they weren't that cruel. Whom did they put in there?

Not Walkinok. Not Shank. Not Harris or Cohen or any cadet. A cadet wouldn't lie there and cry like that, like a child, a schoolgirl—a baby.

Some stranger, then.

Now the anger comes, shouldering out all the fear. They wouldn't! This ship is everything a cadet was born for—no, made for. That tight leash that bound you with the others, all your

thinking, an easy thing you all shared and never had to think about—that was a thing that didn't admit strangers.

Aside from that—beyond that—this wasn't a matter of desecrated *esprit*; it was a matter of moral justice. Nobody but a cadet *deserves* a ship! What did you give your life to and what for? Why did you give up marriage, and freedom, and all the wonderful trivialities called "fun" that made most human lives worth living? Why did you hold still for Base routines and the hazing you got from the upper classmen?

Just to have some stranger, someone who wasn't even a cadet, wander in without training, shaping, conditioning, experience . . . and get on your ship?

NO, it has to be a cadet. It couldn't be anything else. Even a cadet who could break down and cry—that's a more acceptable idea than its being a woman or a stranger.

You're still angry, but now it's the kind of anger that goads you, not the kind that stops you. You push the button. You hear the carrier, then the beginnings of something else . . . Breathing. Difficult, broken breathing, the sound of someone too tired to cry any more, even when crying has changed nothing and there are still more tears to come.

"What the hell are you bawling about?" you yell.

The breathing goes on and on. Finally it stops for a moment and then a long, whispery, shuddery sigh.

"Hey!" you shout. "Hey—you in there!"

But there is no answer. The breathing is fainter, more regular. Whoever it is is going to sleep.

You press even harder on the button, as if that would do any good, and you yell again, this time not even "Hey!" but a blunter, angrier syllable. You can think only that your shipmate chooses—*chooses*, by God! —not to answer you.

You're breathing hard now, but your shipmate isn't. You hold your breath and listen. You hear the deep, quiet inhalations, and then a small catch, and a little sigh, the ghost of half a sob.

"*Hey!*"

Nothing.

You let the button go and in the sharp silence that replaces the carrier's faint hum, the same wordless syllable builds and builds inside you until it bursts free again. You can tell from the feel of your throat and the ringing in your ears that it's been a long, long time since you used your voice.

You're angry and you're hurt

from these insults to yourself and to your Service. And you know what? You feel good. Some of the stereos you have are pretty nice; they take you right into battle, into the arms of beautiful women, into danger, and from time to time you could get angry at someone in them. You could —but you haven't for a long time now. You haven't laughed or been angry ever since . . . since . . . well, you can't even remember when. You'd forgotten how and you'd forgotten just when it was you forgot. And now look. The heart's going, the sweat . . .

This is fine.

Push the button again, take another little sip of anger. It's been aging; it's vintage stuff. Go ahead.

You do, and up comes the carrier.

"Please," begs the voice. "Please, please . . . say something else."

YOUR tongue is paralyzed and you choke, suddenly, when you swallow wrong. You cough violently, let go the button and pound yourself on the chest. For a moment, you're in bad shape. Coughing makes your thinking go in spurts, and your thinking is bouncing up and down on the idea that, until now, you didn't really believe there was anyone in there at all. You get your wind and push the button again.

The voice asks, "Are you all right? Can I do anything?"

You become certain of something else: that isn't a voice you recognize. If you ever heard it before, you certainly don't remember it. Then the content of it hits you. *Can I do anything?* You get mad again.

"Yeah," you growl. "Hand me a glass of water." You don't have your thumb on the button, so you just say what pops into your mind. You shake yourself like a wet bird dog, take a deep breath, and lean on the control again.

Before you can open your mouth, you're in a hailstorm of hysterical laughter. "Glass of water . . . uh-uh-uh . . . that's good . . . you don't know what this means," says the voice, suddenly sober and plaintive. "I've waited so long. I've listened to your music and the sound from your stereos. You never talk, you never say anything at all. I never even heard you cough before."

Part of your mind reacts to that: *That's unnatural, not even to cough, or laugh aloud, or hum. Must be a conditioning.* But most of it explodes at this stranger, this—intruder, talking away like that without a word of explanation, of apology . . . talking as if that voice of all voices had a right to be there.

"I was beginning to think you

were deaf and dumb. Or maybe even that you weren't there at all. That was the thing that scared me the most."

"Shut up," you hiss, with all the fury, all the deadly warning you can command.

"I knew they wouldn't," the voice continues happily. "They'd never put anyone out here by himself. That would be too—" It stops abruptly as you release the button.

"My God!" you think. "The dam has boist! That character'll chunter along like that for the duration!"

You press the button quickly, hear "—all alone out here, you get scared to look out the viewp—" and you cut off again.

THAT stuff like an invisible mist you see melting away is all the conjecture, those great half-formed plans of shipping out with Walkinok or the Wire-haired Terror.

You were going to review your courses, remember? Slow and easy—take a week on spatial ballistics or spectroscopy. Think it all through for a day between sentences. Or laugh over the time you and the Shank got tanked up at the canteen and pretended you were going to tie up the C.O. and jet him off with Colonel Provost, the head PD man, for a shipmate. The General would get all the psychodynamics he needed. The General was always talking psychodynamics, Provost was always doing psychodynamics.

Well, it seemed funny at the time, anyway. It wasn't so much the beer. It was knowing the General and knowing Colonel Provost that made it funny. How funny would it be with a stranger?

They give you someone to talk to. They give you someone you haven't anything to talk to *about!* That idea of putting a girl behind the bulkhead, now, that was a horrible idea. It was torture. Well, so's this. Maybe worse.

A thought keeps knocking and you finally back off and let it in. Something to do with the button. You push it and you can hear your shipmate. You release it and . . . shut off the intercom?

No, by the Lord, you don't! When you were coughing, you were off that button. *Can I do anything?*

Now what the hell kind of business is this? (And that detached part of your mind reaches hungrily for the pulses of fury: ah, it feels good!) Do you mean to sit there and tell me (you rage silently at the PD men who designed this ship) that even if I don't push that button, my shipmate can hear everything

that goes on with me? The intercom's open on the other side all the time, open on this side only when I push the button—is that it?

You turn and glare out the viewport, staring down the cold, distant eye of infinity, and *Where the hell,* you storm silently, *is my privacy?*

This won't do. It won't do at all. You figured right from the start that you and your shipmate would be pretty equal, but on a ship, even a little two-passenger can like this, someone's got to be in command. Given that the other compartment has the same stereos, the same dispensers, the same food and water and everything else, and the only difference between these living quarters is that button—who's privileged? Me, because I get to push the button? Or my shipmate, who gets to listen in on me when I so much as cough?

"I know!" you think suddenly. "That's a PD operative in there! A psychodynamics specialist assigned to observe me!"

YOU almost laugh out loud; relief washes over you. PD work is naturally hush-hush. You'll never know how many hours during your course you were under hypnosis. It was even rumored around that some guys had cerebral surgery done by the PD boys and never knew it. The boys had to work in secret for the same reason you don't stir your coffee with an ink-stick—PD is one field where the tools must leave no mark.

Well, fine, fine. At last this shipmate makes some sense: at last you've got an answer you can accept. This ship, this trip, is of and for a cadet—but it's PD business. The only non-cadet who'd conceivably be aboard would have to be a PD tech.

So you grin and reach for the button. Then, remembering the way it works, that the intercom's open from your side when you're off the button, you draw your hand back, face the bulkhead, and say easily, "Okay, PD, I'm on to you. How'm I doing?" You wonder how many cadets tumble to the trick this soon. You push the button and wait for the answer.

The answer is "Huh?" in a mixture of shyness and mystification.

You let go the button and laugh. "No sense stringing it out, Lieutenant." (This is clever. Most PD techs are looeys; one or two are master sergeants. Right or not, you haven't hurt his feelings.) "I know you're a PD man."

There's a silence from the other side. Then: "What's a PD man?"

You get a little sore. "Now see here, Lieutenant, you don't have to play any more of these psych games."

"Gosh, I'm no lieutenant. I—"

You cut him off quickly. "Sergeant, then."

"You got me all wrong," says that damnable high voice.

"Well, you're PD, anyway."

"I'm afraid I'm not."

You can't take much more of this. "Then what the hell are you?"

A silence. And as it beats by, that anger and that fear of torture begin to mount, hand in hand.

"Well?" you roar.

"Well," says the voice, and you can practically see it shuffle its feet, "I'm not anything. I'm fifteen years old . . ."

You drag out your senior-class snap; there's a way of talking to fourth and third classmen that makes 'em jump. "Mister, you give an account of yourself, but now. What's your name?"

"Skampi."

"Skampi? What the hell kind of a name is that?"

"It's what they call me."

Did you detect a whisper of defiance there? "*Sir!*"

The defiance disappears instantly. "It's what they call me . . . sir."

"And what are you doing on my ship, mister?"

A FRIGHTENED gulp. "I—I'm sorry—uh—sir. They put me on."

"They?"

"At the Base . . . sir," he amended quickly.

"You were on the Base just how long, mister?" That "mister" can be a lead-shot whiplash if you do it right. It was sure being done right.

"I don't know, sir." You have the feeling the punk's going to burst into tears again. "They took me to a big laboratory and there were a lot of sort of booths with machines in them. They asked me all kinds of questions about did I want to be a spaceman. Well, I did. I always did, ever since I was a kid. So, after a while, they put me on a table and gave me a shot and when I woke up, I was here."

"Who gave you a shot? What was his name?"

"I never . . . I didn't find out, sir." A pause. "A big man. Old. He had gray hair, very short, and green eyes."

Provost, by God. This is PD business, all right, but from where you sit, it's monkey business.

"You know any spatial ballistics?"

"No, sir. Some day, I—"

"Astrogation?"

"Only what I picked up myself. But I'll—"

"Gravity mechanics? Differentials? Strength of materials? Light-metal fission? Relativity?"

"I—"

"Well? *Well?* Speak up, mister!"

"I heard of them, sir."

"'I heard of them, sir!'" you mimic savagely. "Do you know what this ship is for?"

"Oh, yes, sir! Everybody knows that. This is the Long Haul. When you come back from this, you get your commission and they give you a starship!" And if the voice had shuffled its feet once, now its eyes shone.

"You figure to get a starship, mister?"

"Well, I—I—"

"You think they give commands to Boy Scouts just because the Boy Scout wants to go to space *awful* bad?"

No answer.

You jeer, "Have you got the slightest idea how much training a cadet has to go through, how much he has to learn?"

"Well, no, but I guess I will."

"Sir!"

"Sir. They put me aboard, all those officers who asked me the questions and everything. It must be all right. *Hey!*" he says excitedly, all the crushed timidity disappearing, to be replaced by a bubbling enthusiasm. "*I* know! We have all this time . . . maybe you're supposed to teach me astrogation and relativity and all that."

Your jaw drops at the sheer childishness of it. And then something really ugly drifts up and smothers everything else.

FOR some reason, your mind flashes back to the bus, the day you got to Base. You can remember back easily to all the faces you worked with, those who made it and those who didn't. But your class had thirty-eight cadets in it and that bus must have held fifty. What happened to the rest? You'd always assumed they went into other sections—ground crew, computer men, maintenance. Suppose they'd been sorted out, examined for some special trait or talent that only the PD men knew about? Suppose they were loaded right aboard ships, each with a graduate cadet?

And why?

Suppose these punks, greenhorns, Boy Scouts, *children*—suppose they were the ones slated for a commission? Suppose guys like you, thinking all this while you were the cream of the crop, and the top cream off that—suppose all along you'd tested out as second-grade material. Suppose you were the one who did the sweating and cramming and took the hazing and the demerits and the lousy mess-hall

food, not to command a starship, not to get a commission, but just to be a private tutor to a boy genius who wanted to go to space *awful* bad?

This wouldn't make sense anywhere else but in the starship service. It barely made sense there, but look:

A starship commander might make two trips in his whole career, that's all. Eighteen years each round trip, with his passengers in coldpacks and a cargo of serums, refractories, machine tools and food concentrate for the xenologists and mineralogists who were crazy enough to work out there.

Training the commander for such a ship was easy, as far as operating knowledge was concerned, though there was a powerful lot of it. But training him to stay conscious, awake and aware—and alone—for all those years was something else again. Few men like that were born; they had to be made.

Most of your recluses, your hermits, all through history, have been guys who had things drastically wrong with them. There couldn't be anything wrong with a starship commander. He had to be captain and deck crew, and know his black-hole as well (though most of the drive machinery down there was automatic) and stay alert— stay sane—in a black, mad, weightless emptiness God never made him for.

GIVE him more books and pictures, games and music than even he would have time for and you'd still not be sure he'd stay sane unless he had some very special inner resources.

These (and one other thing) were what a cadet was screened for and what he was trained in. PD packed him full of technical knowledge, psyched him to a fare-thee-well, and when they figured he was machine-finished and carrying a high gloss, they sealed him in a space can and threw it out for the Long Haul.

The course was pre-set, and it might last 14 months, and it might last three years, and after a guy got back (if he got back), he would be fit to take out a starship or he would not. As for the shipmate—well, you'd always assumed that PD was looking for a way to shake down two guys at once so they could be together on a starship.

Maybe, some day, the ships would carry eight, ten at once, and at last natural human gregariousness would have a chance to compete with the pall of black distances. So far, though, psychic disorientation had made everything that was latently mean and murderous in a man explode

into action. Putting more than a single human being on those boats to nurse them through was just asking for slaughter. And shipwreck.

The other thing required of you besides technical ability and these inner resources is—youth. You're only twenty-two, so full of high-intensity training that, as Walkinok once said, you feel your brain convolutions are blown out smooth like a full bladder. And you've compacted this knowledge, coded it, used it. You're so full of it that it's bound to ooze out onto anyone around you.

You're twenty-two and you're sealed up in a can with a thirsty-headed fifteen-year-old who knows nothing, but wants to go to the stars *awful* bad. And you can forget how stupid he seems to be, too, because you can bet your bulging cortex that the kid has such an enormous I.Q. that he can afford to act stupid and cry.

What a dirty, rotten, lousy deal to put you through all this just to shave seven years off the age of a starship commander! Next thing you know, they'd put a diapered baby in with a work-weary sucker of a fine-honed cadet and get three star trips out of him instead of two!

And what's to become of *you*? After you've done your generous stint of tutoring, they pin a discharge emblem on your tunic and say, "Well done, Cadet. Now go raise Brussels sprouts." And you stand at attention and salute the downy-cheeked squirt in all the gold braid and watch him ride the gantry crane to the control cabin you've aimed at and sweated for ever since you were weaned!

You sprawl there in that living space, so small that you can't stand up in it, and you look at that bland belly of a bulkhead with its smooth, round navel of a button, and you think, "Well, there's a lot of guts back of that." You heave a deep breath, while still the detached part of your mind looks on. Now it's saying wonderingly, "Aren't you the guy who was scared because nothing could get him excited any more?" And you speak and your voice comes out sounding quite different from anything you've ever heard from anyone before. Maybe you've never been this mad before.

"Who told you to say that?"

YOU push the button and listen.

"Say what—uh—sir?"

"About me teaching you. Anybody at Base?"

He seems to be thinking. "Why, no, sir. I just thought it would be a good idea."

You don't say anything. You just hold the button down.

He says diffidently, "Sort of pass the time?" When you still don't say anything, he adds wistfully, "I'd try. I'd try awful hard."

You let go the button and growl, "I just bet you would. You just thought it up all your own little self, huh?"

"Well, yes."

"You're a bright boy. You're a real, smart, ambitious little *louse*!"

You push the button real quick, but all you get is an astonished silence.

You say, real composed, almost gentle, "That 'louse,' now, that's not just a figure of speech, little boy. I mean that. I mean you're a crummy little crawler looking to suck blood after somebody else has done all the work. You know what you do? You just make like you're all alone in this can. You don't talk to me and you don't listen to me and I'll do you a favor—I'll forget all about you, too. I'm not going to bat your eyeballs together just yet, but don't call me generous, little boy—never that. It's just that I can't reach in there just now."

"No!" That boy can make a real piteous noise when he wants to. "No, no! Wait—please!"

"Well?"

"I don't under—I mean I'm sorry, Cadet. I'm honest-to-Pete sorry. I never meant—"

But you cut him off. You lie back and close your eyes. You're thrumming with fury right down to your toenails.

This, says your internal observer, is all right. This is living.

So the weeks pass, and so do more weeks. You shoot a star and make some notes, and wait a while and shoot it again, and pretty soon you have enough data to fool around with. You get your stylus and block, and the point darts around the way you want it to, and those old figures sit up and lie down and rush around just the way you want them to. You laugh when you do it; wouldn't Junior just love to learn some of these tricks?

Anyway, you figure you're just past the cusp perihelion of your parabola and you're starting back. You know how far you've come and when you'll get back. You laugh again. The sound of your voice reminds you he can hear you, so you crawl over to the bulkhead and push the button.

"Cadet," he says. "Please, Cadet. Please." His voice is hoarse and weak; the syllables come out as if they're meaningless from repetition. He's probably been lying in there for weeks bleating

"Cadet—please—cadet—please" every time you clicked the stylus against your teeth or set the quadrant on your Sun gun.

You spend a lot of time looking out the viewport, but you get sick of that and turn to the euphorics. You see a lot of stereo shows. You are always aware of the button in the bulkhead, but you ignore it. You read. You get a lot of use out of the octant; it seems you take a lot more bearings than you have to. And when at last the button starts to be intrusive, you make a real effort and leave it alone; you figure out something else to do instead.

You take a careful survey of your instruments to figure which one you need least, and finally decide on the airspeed indicator. You've spent plenty of time in a mockup and you know you can compute your airspeed when you return to Earth by the hull-temperature plus your ground-rise radar.

You dismount the instrument and take it apart and get the diamond bearing. You go through the games locker and the equipment chest until you put together a nickel rod and a coil, and you hook on to your short-range radio where the oscillations suit you. You cement the diamond to the tip of the rod, shove the rod through the long axis of the coil. You turn on the juice and feel (rather than hear) the rod humming softly.

"The phenomenon, dear pupil," you say, but silently, "is magneto-striction, whereby the nickel rod contracts slightly in the magnetic field. And since the field is in oscillation, that diamond on the tip is vibrating like crazy."

You get your stylus and, after careful consideration, decide on a triangle with round corners, just big enough to shove an arm through comfortably; the three corners would make peepholes.

ALL the while, you have quick fantasies about it. You'll knock the triangular piece out of the bulkhead and stick your face in the hole and say "*Surprise!*" and he'll be cowering there, wondering what goes on. And you'll say, "Shake and let bygones be." And he'll jump over, all eager, and you'll take his hand and drag it through the hole and put your back against the bulkhead and pull till his shoulder dislocates.

He's gasping, "Cadet, please," until you get tired of amusing yourself and haul the wrist around and sink your teeth in it. Then he starts to bleed, and you just hold him there while "Cadet-please" gets fainter and fainter, and you explain to him all about

differential equations and mass-ratios.

And as you're thinking about this, you're going round and round the blunted triangle with your vibrating diamond. The bulkhead is thick as hell and tough—it's hull-metal; imagine that, for an inboard bulkhead!—but that's all right. You've got plenty of time. And bit by bit, your scored line goes deeper.

Every once in a while, you take a breather. It occurs to you to wonder what you'll say when you're grappled in and the Colonel sees that hole in the bulkhead. You try not to wonder about this, but you do all the same, a whole lot. You run it over in your mind and sometimes the Colonel says, "Good, Cadet. That's real resourcefulness, the kind I like to see." But other times it doesn't quite come out that way, especially with the kid dead on one side of the bulkhead and his blood all over the place on the other side.

So maybe you won't kill him. You'll just scare him. Have fun with him.

Maybe he'll talk, too. Maybe this entire Long Haul was set up by PD just to find out if you'd cooperate with your shipmate, try to teach him what you know, at any cost. And you know, if you thought more of the Service than you do about your own dirty career in it, that's just what you'd do. Maybe if you did that, they'd give you a starship, you and the kid both.

So, anyway, this cutting job is long and slow and suits you fine; no matter what you think, you go on with it, just because you started. When it's finished you'll know what to do.

Funny that the result of this trip was going to be the same as some of those you'd heard whispered about, where a ship came in with one guy dead and the other . . .

But that was the difference. To do a thing like that, those guys must have been space-happy. You're doing it, sure, but for different reasons. You're no raving looney. You're slow-and-steady, doing a job, knowing exactly why.

Or you will, when the time comes.

You're real happy this whole time.

Then all that changes.

JUST why, you can't know. You turned in and you slept, and all of a sudden you're wide awake. You're thinking about some lab work you did. It was a demonstration of eddy-current effects.

There was a copper disk as thick as your arm and a meter in diameter, swinging from a rope

in the center of the gymnasium. You hauled it up to the high ceiling at the far end and turned it loose. There was a big electromagnet set up in the middle of the place, and as the disk reached the bottom of its long swing, it passed between the poles of the magnet, going like hell. You threw the switch and the disk stopped dead right where it was and rang like a big gong, though nothing had touched it.

Then you remember the sixty zillion measurements you'd taken off a synchro-cosmotron so huge that it took you four minutes at a fast walk to get from one end to the other.

You remember the mockups, the hours and hours of hi-G, no-G; one instrument out, another, all of 'em, some of 'em; simulated meteorites on collision orbit; manual landing techniques —until your brains were in your hands and the seat of your pants, and you did the right things with them without thinking. Exhausted, you still did it right. Even doped up.

You remember the trips into town with Harris and Flacker and the others. Something happened to you every time you so much as walked down a street with those guys. It was a thing you'd never told anyone. Part of it was something that happened between the townspeople and your group. Part of it was between your group and yourself. It all added up to being a little different and a little better . . . but not in a cocky way. In a way that made you grateful to the long, heavy bulk of a starship and what such ships are for.

You sit up in your bunk, with that mixed-up, wide-awake feeling, reaching for something you can't quite understand, some one simple thing that would sum up the huge equipment, the thousands of measurements, the hours of cramming and the suspense of examinations; the seat-of-the-pants skills and the pride in town . . .

And now you see what it is.

That kid in there, he could have an I.Q. of nine goddam hundred and never learn how to put down a ship with all his instruments out and the gyros on manual. Not by somebody telling him over an intercom when he's never even sat in a G-seat. He might memorize twelve thousand slightly varying measurements off a linear accelerator, but he wouldn't gain that certain important thing you get when you make those measurements yourself. You could describe the way the copper disk rang when the eddy current stopped it, but he would have to see it happen before it did to him all the things it did to you.

YOU still don't know who that kid is or why he's here, but you can bet on one thing—he isn't here to pick your brains and take your job. You don't have to like him and you can be mad he's aboard instead of Harris or Walky; but get that junk out of your head right now about him being a menace to you. Goddlemighty Godfrey, where did that poisonous little crumb in your brain come from? Since when are you subject to fear and jealousy and insecurity? Since when do you have to guard yourself against your own imagination?

Come the hell off it, Cadet. You're not that good a teacher; he's not that much of a monster.

Monster! Did you hear him cry that time?

You feel twenty pounds lighter (which is odd, seeing that you're still in free-fall) and as if you'd just washed your face. "Hey, Krampi!"

You go push the button and wait. Then you hear a sharp inhalation through nostrils. A sniff . . . no, you won't call it that.

"Skampi, sir," he corrects you timidly.

"Okay, whatever you say. And knock off that 'sir.' "

"Yes, sir. I mean yes."

"What were you crying about?"

"When, s—?"

"Okay," you break in gently. "You don't have to talk about it."

"No. I wasn't trying to deny it. I . . . cried twice. I'm sorry you heard me. You must think . . ."

"I don't think," you say sincerely. "Not enough."

He thinks that over and apparently drops it. "I cried right after blastoff."

"Scared?"

"No . . . yes, I was, but that wasn't why. I just . . ."

"Take your time telling me. Time is what we got nothing else but of."

"It was just that I—I'd always wanted to be in space. I thought about it in the daytime and dreamed about it at night. And all of a sudden, there it was, happening to me for real. I . . . thought I ought to say something and I opened my mouth to do it and all of a sudden I was crying. I couldn't help it. I guess I— Crazy, I guess."

"I wouldn't say so. You can hear talk and see pictures and get yourself all ready, but there's nothing like doing it. *I* know."

"You, you're used to it."

HE seems to want to say something else; you hold the button down. Finally, with difficulty, he asks, "You're big, aren't you? I mean you're . . . you know. Big."

"Well, yes."

"I wish I was. I wish I was good for . . . well, something."

"Everybody push you around?"

"Mm."

"Listen," you say. "You take a human being and put him down next to a starship. They're not the same size and they're not the same shape, and one of 'em's pretty insignificant. But you can say that *this* built *this*, not the other way around."

"Y-e-eah." It is a whisper.

"Well, you're that human being, that self-same one. Ever think of that?"

"No."

"Neither did I, till now," you admit rapidly. "It's the truth, though."

He says, "I wish I was a cadet."

"Where do you come from, kid?"

"Masolo. It's no place. Jerk town. I like big places with big things going on. Like the Base."

"Awful lot of people charging around."

"Yeah," he says. "I don't like crowds much, but the Base—it's worth it."

You sit and look at the bulkhead. It's companionable, suddenly, and sort of changed, as if it had just grown warm, or quilted. You get a splinter of light off the bright metal where you've scored it. You think it's down pretty deep. A man could stand up to it and knock that piece out with a maul, if a man could stand up, if he had a maul.

You say, very fast, as if you're afraid something's going to stop you, "Ever do anything you were really ashamed of? I did when I talked to you the way I did. I shouldn't've done it like that . . . I don't know what got into me. Yes, I do and I'll tell you. I was afraid you were a boy genius planted on me to strip my brains and take my command. I got scared."

It all comes out like that. You feel much better and at the same time you're glad Walkinok or Shank aren't around to hear you spout like that.

THE kid's very quiet for a while. Then he says, "One time my mother sent me to the market and something was a special, I forget what. But anyway I had forty cents change and I forgot about it. I found it in my pants in school next day and bought a starship magazine with it and never told her. I used to get every issue that way after that. She never missed the money. Or maybe she did and didn't say anything. We were pretty hard up."

You understand that the kid is trying to give you something,

because you apologized to him. You don't say anything more about that. Right here, a wonder starts to grow. You don't know what it is, but you know that standoff-and-watch part of your mind is working on it.

You say, "Where is this Masolo?"

"Upstate. Not far from Base. Ever since I was a baby, the axitugs were shaking the house when they took off. There's a big tree outside the house and all the leaves shiver—with the tugs, you know. I used to climb out a limb and get on the roof and lie down on my back. Sometimes you could see the starships orbiting. Just after the Sun goes down, sometimes you can . . ." He swallows; you can hear it plainly. "I used to put out my hand. It was like a firefly up there."

"Some firefly," you say.

"Yeah. Some firefly, all right."

Inside you, the wonder is turning to a large and luminous astonishment. It's still inexpressible, so you leave it alone.

The kid is saying, "I was with two other fellows out by the high school one time. I was just a kid—eleven, I think. Well, some gorillas from the high school chased us. We ran and they caught up with us. The other kids started to fight them. I got over to one side and, when I had a chance, I ran. I ran all the way home. I wish I'd stayed there with those other two kids.

"They got the tar kicked out of them and I guess it hurt, but I guess it stopped hurting after some teacher came along and broke up the fight. But I hurt every time I think about running away like that. Boy, did those two give me a razzing when they saw me next day! *Boy*! So what I wanted to ask you, you don't think a kid who would run away like that could be a cadet."

He ends it like that, flat. No question.

YOU think about it. You've been in some fine brawls as a cadet. You're in a bar and someone cracks wise, and your blood bubbles up, and you wade in, feeling giant-size. But maybe that's just because of the business of belonging.

You say carefully, "I think if I was in a fight, I'd rather have a guy on my side who knew what being scared felt like. Then it would be like having two guys on my side, instead of one. One of the guys wouldn't care if he got hurt and the other guy would never want to be hurt that way again. I think a fellow like that would be a pretty good cadet."

"Well, yeah," says the kid, in that funny whisper.

Now the inner astonishment

bursts into sight and you recognize what it is about this kid.

At first, you were scared of him, but even when that went away, you didn't like him. There was no question of liking him or not liking him; he was a different species that you couldn't have anything to do with.

And the more you talked with him, the more you began to feel that you didn't have to set yourself apart from him, that he had a whole lot you didn't have—and that you could use it. The way he talked, honest and unabashed; you don't know how to do that. You nearly choked to death apologizing to him.

It suddenly is very important to get along with this kid. It isn't because the kid is important. It's because if you can get along with somebody so weak, so wet behind the ears, and yet in his peculiar way so rich, why, you can get along with anybody, even your own lousy self.

And you realize that this thing of getting along with him has extension after extension. Somehow, if you can find more ways to get along with this kid, if you can see more things the way he sees them with no intolerance and no altitude, you'll tap something in yourself that's been dried up a long time now.

You find all this pretty amazing, and you settle down and talk to the kid. You don't eke it out. You know he'll last all the way back to Base and have plenty left over. You know, too, that by the time you get there, this kid will know a cadet can also be a louse. You can give him that much.

The way you treated him, he was hurt. But you know? He wasn't mad. He doesn't think he's good enough to get mad at a cadet. He thinks a cadet rates what he does just by being a cadet.

Well, you are going to fix that.

THE time goes by and the time comes; the acceleration tug reaches out and grabs you high above Earth, so, after all that manual-control drill, you don't have a thing to do but sit there and ride it down.

The tug hovers over the compound right near the administration building, which disappears in a cloud of yellow dust. You sink down and down in the dust cloud until you think they must be lowering you into a hole in the ground. Then, at last, there's a slight thump and an inhuman amount of racket as the tug blasts away free.

After that, there's only the faint whisper of the air circulator, the settling dust, and a profoundly unpleasant feeling in calves and chest as the blood gets

used to circulating in a 1-G environment.

"Now don't you forget, Skampi," you say. You find it difficult to talk; you've got a wide grin plastered across your face and you can't cast it adrift. "Just as soon as they're through with you, you come looking for me, hear? I'll buy you a soda."

You lean back in your G-chair and hold the bulkhead button.

"I can drink beer," he says manfully.

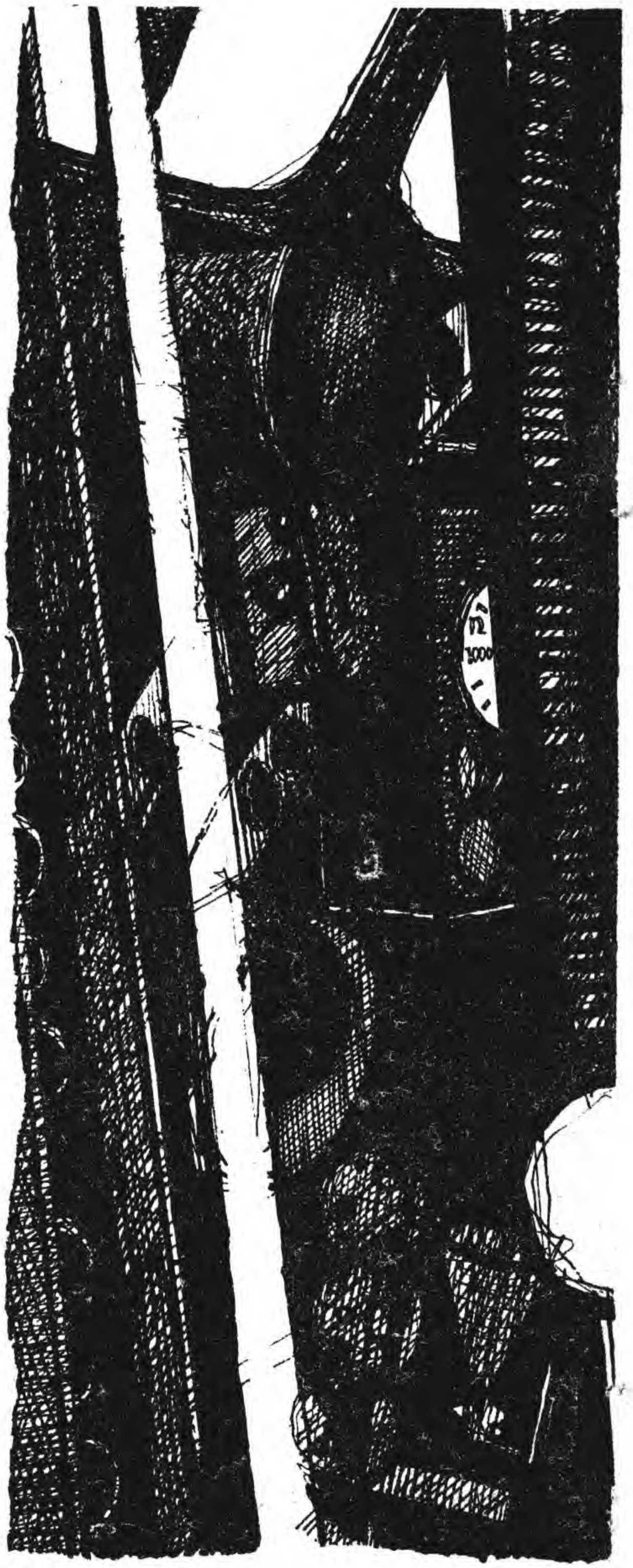
"We'll compromise. We'll make your soda with beer. Listen, kid. I can't promise, but I know they're fooling with the idea of a two-man crew for starships. How'd you like to go with me—one trip, anyhow? Of course, you'll have to be conditioned six ways from the middle, double-time, and it'll be real rough. But —what do you say?"

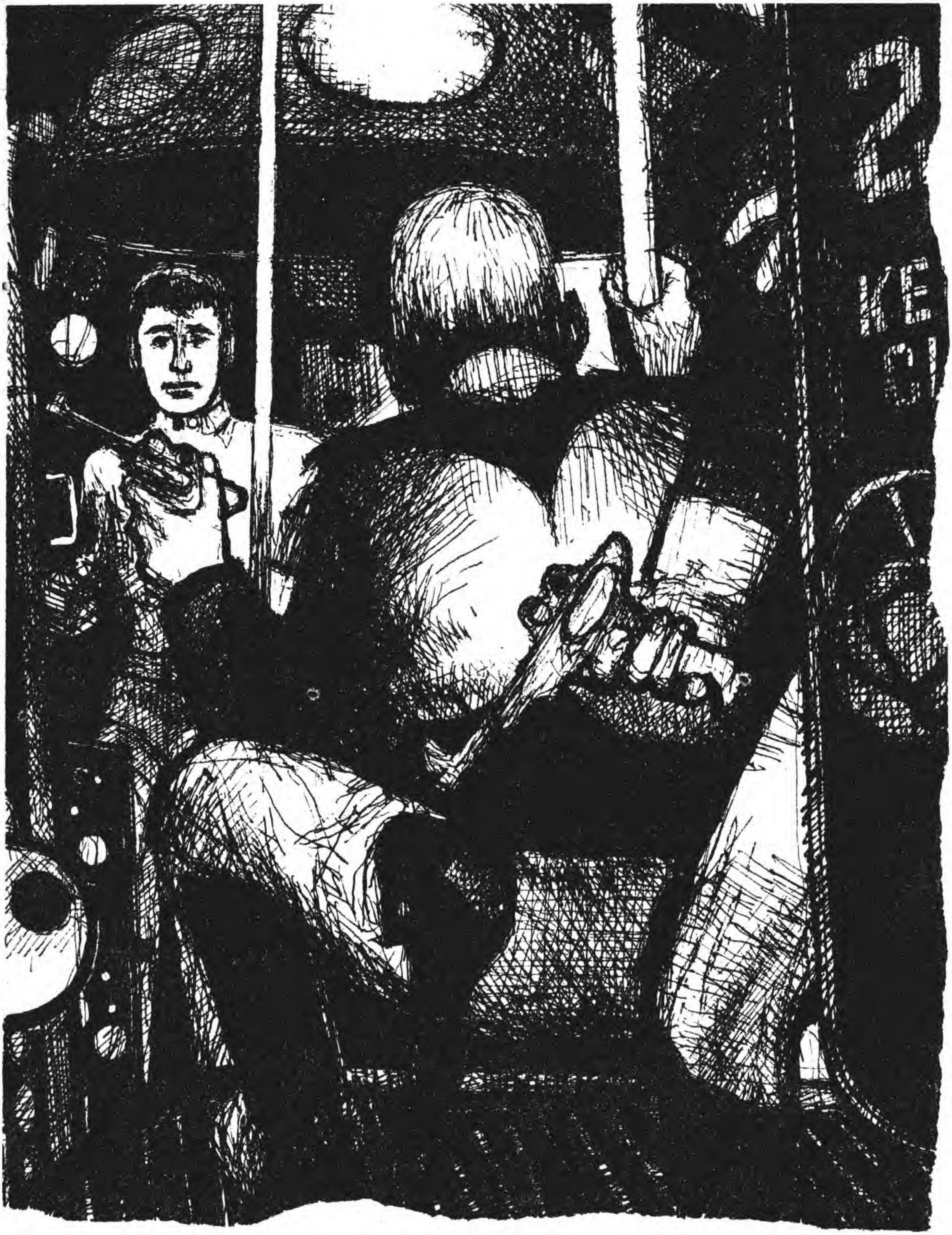
And you know? He doesn't say anything!

He laughs, though.

NOW here comes Colonel Provost, the *big* big brass of Psychodynamics, and a young M.P. That's all the welcoming committee you'll get. The compound's walled and locked, and no windows look out on it. They must have unloaded some pretty sorry objects from these space cans from time to time.

They open the hatch from the

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outside and you immediately start coughing like hell. Your eyes say the dust has settled, but your lungs say no. By the time you have your eyes wiped, the M.P. is inside and squatting on the deck, cross-legged.

He says cheerfully, "Hi, kaydee. This here's a stun gun and if you so much as squint at me or the Colonel, you get flaked out like a heaving-line."

"Don't worry about me," you say from behind that silly grin. "I got no quarrel with anybody and I like it here. Good morning, Colonel."

"Look out for this one," said the M.P. "Likes it here. He's sick."

"Shut up, wheelhead," says the Colonel cheerfully. He has his gray crewcut and barrel torso shoved into the hatch and it's real crowded in that little cabin. "Well, Cadet, how are we?"

"We're fine," you say. The M.P. cocks his head a little to one side and gets bright-eyed. He thinks you're sassing the C.O., but you're not. When you say "we," you mean you and your shipmate.

"Anything special happen?"

The answer to that is a big fat yes, but it would take forever to tell. It's all recorded, anyway; PD doesn't miss a trick. But that's from then till now, and done with. You're concerned with from now on. "Colonel, I want to talk to you right now. It's about my shipmate."

The Colonel leans a little further in and slaps the M.P.'s gun hand. He's in front of the guy, so you can't see his face. "Beat it, wheelhead."

The M.P. clears out. You stagger up out of the G-seat and climb through the hatch. The Colonel catches your arm as you stagger. After a long time in free-fall, your knees won't lock as you walk; you have to stiffen each one as your weight comes on it, and you have to concentrate. So you concentrate, but that doesn't stop you from talking. You skim over the whole business, from your long solo to being reduced to meeting your shipmate, and the hassel you had with yourself over that, and then this thing that happened with the kid—weeks and weeks of it, and you've only just begun.

"You can pick 'em, sir," you pant as you lurch along. "Do you always use a little know-nothing kid? Where do you find 'em? Does it always work out this well?"

"We get a commander out of every Long Haul," he says.

"Say, that's great, sir!"

"We don't have very many ships," he says, just as cheerfully.

"Oh," you say.

SUDDENLY you stop. "Wait, sir! What about Skampi? He's still locked in on his side of the bulkhead."

"You first," says the Colonel. You go on into the PD lab. "Up you go."

You look at the big chair with its straps and electrodes and big metal hood.

"You know, they used chairs like these in the French Revolution," you say, showing off. You're just busting with friendliness today. You *never* felt like this. You sit in the big chair. "Look, sir, I want to get started on a project right away. This kid, now—I tell you, he's got a lot on the ball. He's spaceman right to the marrow bones. He comes from right around here, that little place up the pike, Masolo. He got shook out of his bassinet by the axi-tugs. He spent his childhood lying on his back on the roof looking for the starships in orbit. He's—"

"You talk all the time," the Colonel breaks in mildly. "Sum up, will you? You made out with your shipmate. You think you could do it again in a starship. That it?"

"Think we can try it? Hey, really? Look, can I be the one to tell him, Colonel?"

"Close your mouth and sit still."

Those are orders. You sit still. The Colonel gets you strapped in and connected up. He puts his hand on the switch.

"Where did you say you came from?"

You didn't say, and you don't, because the hood swings down and you're surrounded by a sudden dissonant chord of audio at tremendous amplitude. If you had been allowed to say, though, you wouldn't have known.

The Colonel doesn't even give you time to be surprised at this. You sink into blackness.

IT gets light again. You have no idea how much time has passed, but it must be plenty, because the sunlight from outside is a different color and slants a different way through the venetian blinds. On a bench nearby is a stack of minicans with your case number painted on each one —that'd be the tape record of your Long Haul. There's some stuff in there you're not proud of, but you wouldn't swap the whole story for anything.

"Hello, Colonel," you say with your tongue thick.

"You with us again? Good." He looks at an enlarged filmstrip and back at you. He shows you. It's a picture of the bulkhead with the triangular score in it. "Magneto-striction vibrator, with a diamond bearing for a drill bit, hm? Not bad. You guys

scare me. I'd have sworn that bulkhead couldn't be cut and that there was nothing in the ship that could cut it. You must've been real eager."

"I wanted to kill him. You know that now," you say happily.

"You damn near did."

"Aw, now, Colonel! I wouldn't have gone through with it."

"Come on," he says, opening the buckles.

"Where, sir?"

"To your space can. Wouldn't you like to have a look at it from the outside?"

"Cadets aren't permitted—"

"You qualify," says the old man shortly.

So out you go to the compound. The can still stands where it was landed.

"Where's Skampi?" you ask worriedly.

The Colonel just passes you an odd look and walks on. You follow him up to the can. "Here, around the front."

You walk around to the bow and look up at it. It's just the shape it ought to be from the way it looked from inside, except that it looks a little like a picture of a whale caught winking at you.

Winking?

One-eyed!

"Do you mean to tell me you had that kid in a blind compartment, without so much as a viewport?" you rage.

The Colonel pushes you. "Sit down. Over there. On the hatch. You returning heroes and your manic moods . . . *sit down!*"

You sit on the edge of the open hatch.

"Sometimes they fall over when I explain," he says gruffly. "Now what was bothering you?"

"Locking that kid up in a dark—"

"There isn't a kid. There isn't a dark cabin. There's no viewport on that side of the can. It's a hydrazine tank."

"But I—but we—but the—"

"Where do you come from?"

"Masolo, but what's that to—"

"What did your mother and all the kids call you when you were a space-struck teener?"

"Scampy. They all—*Scampy?*"

"That's right," he says bluntly.

ROCKED, you cover your face. "By God! I can remember now, thinking back in detail over my whole life—it started *in the bus* that day I passed the entrance exams. What is it? Please, *what is it?*"

"Well, if you want me to get technical, they call it Dell's hypothesis. It was formulated way back in the middle of the 20th century by Dudley Dell, which was one of the pseudonyms of a

magazine editor. As I remember it, he later became a lay analyst and—"

"Please, Colonel!" You're in trouble.

"Okay, okay," he says soothingly. "Well, up to that time, psychiatry had been banging its head against a stone wall—usually banging up the patient in the process. Those early therapists knew that childish feelings and motivations were interfering with adult efficiency and happiness. When a man would slam out of his house and do a lousy day's work after a fight with his wife, the doctor would tell him, 'You're acting *as if* you were a child rejected by its mother,' and this was—"

"Colonel, sir, are you going to please tell me what the hell's with *me*?"

"I am," he answers calmly. "This, as I was beginning to explain, was all wrong because the 'as if' concept kept the patient from distinguishing his adult feelings and motivations from those of the child within him—a very viable, hard-fighting, but frightened and confused kid it was, too. And smart. Smart enough, at any rate, to see rejection for just what it was. And if it went far enough, the doctor would say hopelessly, 'Mm-*hmm*, schizophrenia,' thereby scaring the liverwurst out of the patient. Dell stopped all that wreckage."

"Dell stopped all that," you repeat, suffering.

"It was a little thing, that hypothesis of his—little like $E = MC^2$ or Newton's apple—but, oh, my, what happened!"

"Oh, my," you agree. "What happened?"

"Dell began directing therapy to the infantile segment, treating it as a living, thinking, feeling organism. It responded so excellently that it changed the face of psychoanalysis. Now in your case—you're not going to interrupt?"

YOU shake your head blankly but obediently.

"Good. In your case, an extension of Dell's hypothesis was used. The sum total of your life up until you took your entrance examinations to this Base was arrested at the age of 15. A hypnotic barrier was erected so that you could have no access to any of this. You—all of you cadets—literally start a new life here, with no ties whatever to an earlier one. Your technical education very deliberately has no reference factors to anything but itself. You learn quickly because your minds are uncluttered. You never miss your past because we're careful never to reactivate it.

"When this approach was first tried, the subjects were gradu-

ated with memories only of their training. Well, it didn't work. Childhood conditioning is too important to the entire human being to be wiped out without diminishing the subject in just about every emotional way. So we developed this new system. That's what we used on you.

"But we discovered a peculiar thing. Even in untrained adults —as opposed to the sharp division of pre- and post-entrance you have here—even untrained adults suffer to greater or lesser degree from internal strife between childhood and adult interpretations and convictions. An exaggerated example would be a child's implicit belief in Santa Claus and the Easter bunny, existing at one and the same time with the adult's realization that these are only legends. The inner child—the child within the adult —still exists, according to Dell and to all tests since, and will fight like the very devil for survival, beliefs and all . . . *espepecially* one whose beliefs and natural feelings and reactions had been made grounds for punishment or ridicule.

"The schism between you and Scampy was extreme; you were, in effect, born on different planets. To be a complete human being, you had to be integrated. But to be integrated successfully, you and Scampy had to learn how to get along together. For Scampy, this was not difficult—you, even in injustice and cruelty, were a real live hero-image. But the adult you had a stonier path. Somewhere within yourself, though, you somehow found an element of tolerance and empathy, and used it to bridge the gap.

"I may say," added the Colonel severely, "that it takes a particularly fine kind of person to negotiate this difficult merger. But I also have to say that it's always completed."

"Always?" you ask, astonished.

"In every single case. I know there are all sorts of rumors about psychotics being taken out of the space cans—the M.P.s standing by when we open them reinforce the rumors, but that's only precautionary *in case* it ever happens. It hasn't yet and I doubt if it will."

REMEMBERING those stories and thinking about your own taste of private hell, you protest, "But I *almost* went nuts, Colonel!"

"Not a chance," he says. "That was the value of Dell's hypothesis—by being able to contact the child within you (and it exists in every adult, if you're wondering), you could make friends with him. Stop frowning! What else could you do with such an

eager, friendly, admiring kid? And that admiration is important—because he has such confidence in you, you will, too. And that confidence lets him relax so you can take over situations you've been trained to handle and he hasn't.

"Well, that's what Dell discovered was the cause of emotional difficulty, which he substituted for the ancient and useless 'neurosis' and 'psychosis' labels. When the child within is contacted and reassured, as you did on this trip, he can leave the controls to the adult. And, as I said, it always happens. The child feels secure because it's liked and because it trusts the adult self and is trusted. The adult self *also* feels liked and trusted. Well, what else could that produce but a person at peace with himself?"

"But he *talked* to me! Don't tell me you've secretly invented a telepathic converter with band-pass filters!"

"Of course not. How are your thoughts expressed to you? As abstract symbols? As wordless cerebration? No. You literally *talk* to yourself, but *subvocally*. You have a subminiature transmitter placed surgically in your pharynx. The button on your bulkhead activated it. There had to be a button, you see; we couldn't have the two of you speaking at the same time, which is what persons in the same room invariably do. You can't subvocalize *and* talk simultaneously. It would have tipped you off. Hence the button."

"I can't get used to it," you complain. "I can't! I practically *saw* the boy! Listen, Colonel—can I keep my built-in transmitter and have the same rig on my starship?"

He smiles, although you think it hurts his face. "You really want it left as is?"

"He's a great kid."

"Very well—Commander. Dismissed." He marches away.

YOU look after him, shaking your head. Then you duck into the space can. You stare at the bulkhead and at the button and at the scoring on the plate where you came *that* close to filling your cabin with your hydrazine supply. You shudder.

"Hey," you call softly. "Scampy!"

You push the button. You hear the carrier. Then, "I'm thirsty," says Scampy.

You cut out of there and go down to the rec area and into the short-order bar.

"A beer," you say. "And put a lump of vanilla ice cream in it. And two straws."

"You crazy?" asks the man.

"No," you say. "Oh, no!"

—THEODORE STURGEON

Big Stupe

By CHARLES V. DE VET

Smart man, Bruckner—he knew

how to handle natives . . . but

they knew even better how to

deal with smart terrestrials!

Illustrated by KOSSIN

BRUCKNER was a man deeply imbued with a sense of his own worth. Now as he rested his broad beam on the joined arms of Sweets and Majesky, he winked to include them in a "this is necessary, but you and I see the humor of the thing" understanding. Like most thoroughly disliked men, he considered himself quite popular with "the boys."

The conceited ham's enjoying this, Sweets thought, as he staggered down the aisle under the big man's weight. At the ship's

entrance, he glanced out across the red-sand plain to where the natives waited.

They wore little clothing, Sweets noted, except the chief. He sat on his dais—carried on the shoulders of eight of his followers—dressed in long streamers of multi-colored ribbons. Other ribbons, rolled into a rope, formed a diadem on his head.

The only man more impressively dressed was Bruckner. He wore all the ceremonial trappings of a second century Gallic king, complete with jewel-studded gold crown.

As Sweets and Majesky grunted with their burden across the ten yards separating the ship from the thronelike chair that had been brought out earlier, their feet kicked up a cloud of red dust that coated their clothing and clogged their nostrils.

The dust had originally been red ferric sand. But the action of winds and storms had milled it together, grain against grain, through the ages, until it had become a fine red powder that hung in the hot still air after they had passed.

Most of Waterfield's Planet, they had discovered on their inspection flight the day before, had been a desert for more centuries than they could accurately estimate. Its oases, however, were large and plentiful and, as observed from the air, followed a clear-cut, regular pattern. The obvious conclusion was that they were fed by underground rivers.

THE crewmen deposited their burden in the chair and stood waiting.

"Nice work, men," Bruckner muttered in an undertone. "Now keep up the act. Bow from the waist and retire discreetly to the background."

Majesky said something under his breath as they complied.

The greeting ceremony got off to a good start after that, Sweets had to admit. Whatever else might be said of Bruckner, he knew his job as a psychologist.

Bruckner rose to his feet, raised his right hand, palm forward, and intoned gravely, "Earthmen greet you." He spoke in the language of the natives.

The tribal chieftain raised his hand negligently in reply, but neither rose nor spoke.

With a great display of magnanimity, Bruckner sent over a bolt of bright red cloth.

The chieftain accepted the gift and sent back a large wooden box carried by two of his men. They lowered the box at Bruckner's feet and one of them opened a door in its side.

The large animal—or bird; the Earthmen couldn't be certain which—that stepped out stood

about seven feet tall, with a body shaped like a bowling pin. It walked on webbed feet that angled outward, had short flippers, set low on a body covered with coarse hair that might have been feathers, and was armed with long, vicious claws. There was something so ludicrous about its appearance that Sweets had difficulty stifling the chuckle that rose in his throat.

The animal, however, took itself very seriously. When it saw its audience — the spaceship's crew — watching, it took two spraddling steps forward, pulled the bulk of its pot-bellied stomach up into its chest and paused dramatically.

It gave three very loud, hoarse burps, somewhere between the squawk of a duck and the braying of an ass. It was a hilariously funny caricature of a pompous orator.

Someone snickered. Immediately Sweets and the other crew members joined in the laughter. It was the kind of belly-laughing that could not be restrained.

While he roared, Sweets took time to observe Bruckner. At the first outbreak of laughter, the psychologist scowled and glanced nervously across at the natives. But when he saw that they, too, had joined in the laughter, he allowed himself to smile condescendingly.

The meeting ended with much apparent good will on both sides.

"WELL, I guess we knew what we were doing, didn't we?" Bruckner said after they were back in the ship.

He made a point of emphasizing the *we*.

"At the time Waterfield's Planet was first discovered," he explained, "the official report was that the natives were friendly. However, when the survey team landed a year later, they ran into trouble. At the beginning, they were courteous and considerate in their dealings with the natives, but the tribesmen took that as a sign of weakness and gave the team very little cooperation. Then they tried being a bit tough and found themselves with a small war on their hands. They were lucky to get away with their lives. So you can see why I'm pleased with the way things went off today."

"If the natives are that touchy, we'll still have to be careful," Sweets said. "What are we supposed to be doing here, anyway?"

Bruckner looked carefully around the circle at each of his listeners. "There's no reason now why I shouldn't tell you," he said confidingly. "The survey team found enough traces of rare elements here to suspect that there might be large deposits on

the planet. That's what we're after."

"And you think there might be trouble?" Majesky asked. Bruckner had his full attention now, Sweets noted. There was always a kind of leashed vitality about Majesky that made him poor company during a space trip, but he was the type of man you'd want on your side in a rough-and-tumble.

"I certainly do not," Bruckner answered, frowning in annoyance. "It's my job to see that we don't have trouble. I went very carefully over the records of the two previous landings, even before we began this trip, and I believe I understand the psychological compulsions of these tribesmen quite well."

"You mean you know what makes 'em tick?" Majesky asked.

"Yes, I think I can safely say I do," Bruckner said modestly. "Their culture pattern is based on a long history of tribal conflict. And, for a tribe to prosper, they must have a strong as well as resourceful leader. Thus the splendid dress of their chieftain this morning, in contrast to the drabness of the ordinary tribal dress. He must be, very apparently, a man above the common tribesmen to hold their respect.

"And that," Bruckner added, "was the reason for our little act this morning. The best way to impress them with our power is to display the magnificence of our leader. The better we can keep them convinced of my greatness, the less risk there will be of trouble."

BIG Stupe — someone gave their pet the name the first five minutes and it stuck — had the run of the ship. Individually and in groups, the crew took turns amusing themselves with him. And Big Stupe accepted everything they did very seriously and loved the attention. He was definitely a gregarious animal.

And his name fitted perfectly. His gullibility and invariable stupidity seemed to have no limits. He fell for the same practical jokes over and over again. He was clumsy and stumbled over furniture, loose objects and even his own feet.

He would eat anything. If what he swallowed proved indigestible, he would stand for a minute with an astounded expression on his hairy face and then whatever he had eaten would come rolling up. He eagerly gulped down the same rubber ball a dozen times in the space of ten minutes. Whenever spoken to, he replied promptly, in his incredible squawking bray. A "hello," by one of the crew, with an answering bray from Big

Stupe, was always good for a laugh.

Big Stupe had a fear of loud noises and pulled a variation of the ostrich-head-in-hole routine, at every unexpected loud sound, of turning his back to whatever had frightened him and peering cautiously back under a flipper. If a tail feather was pulled, he'd make a determined and prolonged effort to run straight through the ship's wall, flapping and treadmilling and skidding and pushing his beak against it.

Another of his tricks was the dispensing of pebbles—which he seemed to consider very valuable gifts—from his marsupial pouch to the crew members who took his fancy.

Sweets often wondered how an animal with so little common intelligence had survived the evolutionary process. He could spot no counterbalancing ability or survival characteristic. But somehow the species had escaped extinction.

ON the second day, Bruckner sent Sweets and Teller, the head engineer, to the chief with a present and samples of rare ores. Sweets' duties, on the trip out, had included the learning of the native language.

The sun was hot and Sweets wore only his shoes, trousers and a T shirt. It seemed absurd that a sun that appeared no larger than an egg should be so hot. But he knew it generated all that heat because it was a blue sun and not one of the ordinary yellow-white type, as it appeared. The deceptive appearance was caused by the heavy atmosphere that held out the ultraviolet and the heat and light came in on the yellow band. Last night, the darkness had had a dim violet haze.

The interview with Chief Faffin went quite smoothly. He received the Earthmen with great cordiality and Sweets was certain that he detected in the chieftain's manner more than mere courtesy. He seemed to have a genuine liking for them. He accepted gravely the gyroscope top which Bruckner had sent and agreed, without argument or reservations, to send his men in search of the ores that matched the samples Sweets showed him.

He would be happy to assist his friends, the *Lacigule,* the chief said. *Lacigule* was the natives' name for the Earthmen, used in both the singular and the plural.

The same afternoon, a dozen natives brought samples of ores to the ship. At Bruckner's orders, Sweets gave each native a comb from the ship's supply of trading goods.

During the evening, Teller and his men set up a portable mass

spectograph separator at the mine site and, three days later, they had the hold of the ship two-thirds full.

During all this time, the crew members had been restricted to the vicinity of the spaceship and by the third day were showing signs of unrest. They sent Sweets to talk with Bruckner and the captain.

"We'll be leaving here in a few days," Sweets told them. "It's been a long trip out and it'll be another long trip back. The men feel they're entitled to some fun before they go."

"That seems like a reasonable request," the captain said. "What do you think, Mr. Bruckner?"

"It would be risky to let them mingle too freely with the natives," Bruckner advised. "We aren't familiar enough with the local customs. One wrong move might spoil all the good will I've been able to build up so far."

"Unless you let them have a little fun, you're going to be awfully unpopular," Sweets said. Without knowing it, he was something of a psychologist himself.

"Hmmm." Bruckner was thoughtful. "I'm for the men," he said finally. "One hundred per cent. Let's say we wait until tomorrow evening, though. We'll have the hold just about filled by that time. Then it won't matter too much if the natives change their minds about letting us take the ores. How does that sound to you?"

"Fair enough," Sweets agreed.

THE next evening, a full-fledged party was held. Permission had been obtained from Chief Faffin for the crew to visit the village and the tribesmen were waiting for them when they arrived.

Sweets stayed close to Majesky. For the past couple days, the big crewman had been drinking—not heavily, but steadily. The irritation of being restricted to the ship and vicinity, added to the long trip out from Earth, had gradually built up in him an ugly resentment.

Now as the crew members sat in a circle watching the dancing of a half-dozen native men, Sweets noted that Majesky was drunk. He sat with his arms wrapped around his legs, his head resting on his knees, and glared at the dancers. Outside the circle, a pile of brush burned with much crackling of wood-pitch.

After the dance was over, the natives sat solemnly watching the Earthmen. It was soon apparent that they expected their visitors to furnish the next portion of the entertainment program.

Evidently Bruckner had come prepared for this. He rose impressively from his throne—on which he had been carried the quarter-mile from the ship—and said, "We'll have your song now, Billy."

Billy Watts, astrogator of the crew, pulled himself to his feet and, in a high boyish tenor, sang *I'll Take You Home Again, Kathleen.*

Sweets felt his throat quicken as a wave of homesickness went through him like a chill. At the song's end, it needed the yip, yip, yip of the tribesmen's applause to bring him out of his memories of Earth.

The tribesmen continued their applause until Watts rose again. Sweets wondered if they had any music of their own. The men had danced earlier without accompaniment and they had made no sound themselves.

Billy Watts sang two more songs and it was the tribesmen's turn again.

Suddenly a native woman ran out from behind one of the round, mud-packed village huts and into the circle of spectators. She paused on tiptoe, crouched and sprang upward, twisting and screaming as she rose. She landed with her legs in driving motion and went through a racing, energetic series of gyrations. She was almost completely unclothed.

FOR a stunned moment, the men sat motionless in pleased surprise. Then Sweets caught a movement from the corner of his eye and shifted his head to look at Majesky. For the first time in many days, Majesky appeared happy. He had straightened up and his eyes shone with a glow of approval. He raised his arms in a gesture of encouragement and yelled, "Swing it, baby!"

The dancer's stride broke and her head turned sharply in Majesky's direction. Then she ignored the interruption and went on with her dance.

But Majesky was not to be ignored. He climbed to his feet and stood with his head hunched between his shoulders, watching her. Then he lurched forward, caught the girl up in his arms and swung her around in a staggering circle.

It had happened too suddenly for any of the Earthmen to stop him, and now they were unable to decide just what they should do. Most of them turned to Bruckner.

To Sweets, it seemed that Bruckner had gone pale, but it was difficult to be certain in the uneven light cast by the fire. His mouth opened twice before he could speak. And when he did, Sweets almost laughed at the staginess and absurdity of what he said.

"Unhand that woman!" Bruckner commanded.

Bruckner's voice was loud and it penetrated through the haze of Majesky's drunken elation. He stopped his spinning and set the girl on her feet, but he kept his right arm around her waist and glared back at Bruckner.

"Go to hell," he said.

The natives apparently had been as surprised as the crew, for they had not moved. Now, however, one of them rose and lunged at Majesky.

Majesky's face twisted into an expectant grin and he tossed the girl aside and stood with widespread legs, waiting. As the native dived in with his head lowered, Majesky brought his right fist up in a powerful uppercut and smashed it into the tribesman's mouth.

The native continued his dive and landed face down. Natives and Earthmen were on their feet now and moving toward Majesky. Sweets reached him first.

The grin of pleasure was still on Majesky's face as he hit Sweets on the left cheek and spun him half-around. He butted his head into the chest of the next man to reach him, but they pulled him down then and held him helpless.

The natives had paused when they saw the Earthmen grab Majesky.

Now Bruckner made his voice heard above the noise. "Bring him over here!" he yelled.

Two men pinned Majesky's arms while a third held one kicking leg. They dragged him over to Bruckner.

"You damn, dumb fool!" Bruckner cursed fervently. He raised his voice. "All of you," he ordered, "back to the ship!"

The natives made no attempt to stop them.

Sweets glanced back over his shoulder at Chief Faffin as they went. He was standing and intoning sadly, "*Lacigule, lacigule, lacigule.*"

THE following day, Bruckner called Sweets to his quarters.

"That was a rotten piece of business last night," Bruckner said. "But I'm proud of the way you acted. You did some mighty quick thinking there."

Sweets grunted. He knew the flattery was leading to something.

"I've been giving the matter some deep thought since," Bruckner continued, "and I don't think it's too late yet to patch things up. But I need a man with guts." He laughed. "How brave do you feel this morning?"

Sweets shrugged and regarded the other levelly.

"You can speak their language," Bruckner said. "And I don't believe they're sure enough

of themselves to risk bloodshed. How would you like to bring another present to the chief? I'll see that you're—"

"I don't feel like being a hero this morning," Sweets interrupted. "Why don't you go yourself?"

Bruckner's eyebrows raised. "My job is vital to the success of this expedition to risk my life unnecessarily. I'd go myself except—"

"Except that it's too dangerous," Sweets finished for him.

Bruckner straightened and his lips grew narrower. "That will be enough of that. We'll find some way to get along without your help."

The party Bruckner organized to visit the native village pointedly did not include Sweets.

Each man carried a rifle and sidearms. Bruckner walked this time—at their head. But Sweets made a small bet with himself that Bruckner would stay close to the protection of his men. He was willing enough to send another man out alone, but when he had to go himself, he made sure that he was well protected.

Bruckner and his men had been gone almost an hour when Sweets heard the sound of Big Stupe's hoarse squawking from outside the ship. There seemed to be anger in the tones. Before Sweets reached the open portal of the ship, he heard more excited squawks. They were similar to Big Stupe's, but they weren't being made by him.

Outside, Sweets found Big Stupe facing three others of his breed, exchanging loud angry squawks. Soon they began to walk rapidly in their pseudo-dignified spraddles, each in a small circle.

Abruptly they were locked together and it was soon apparent that this was no game. Big Stupe pulled with both flippers at the head of one of his visitors, while another systematically raked his long claws down the sides of Big Stupe's neck. Before Sweets could reach him, the neck was streaming with blood.

Sweets remembered how Big Stupe had always been afraid of loud noises and he raised his voice in a shout. The other stupes turned their backs, but Big Stupe brought one flipper around and hit Sweets squarely between the eyes.

AS Sweets stood stunned, he felt Big Stupe's body crash against his shoulders and this time, when he yelled, it was in alarm and fear.

Then he was free and his eyes swam back into focus. He saw Big Stupe standing with his back turned. The three visitors were shambling off awkwardly.

Sweets left Big Stupe and stumbled back to the ship.

Bruckner returned well pleased with his trip.

"I'd say we handled that exactly right," he said. "I don't know if the other expeditions contacted this particular tribe or not, but at least stories must have reached them of the potency of the Earthmen's weapons. When we showed them that we preferred peace, but were ready to fight if necessary, that was the end of the affair. And the presents we had for Faffin, and for the native that Majesky hit, didn't hurt any. The one thing to keep in mind is that we've got to make them respect us. And those lads have plenty of respect for *Lacigule* right now."

It seemed that Bruckner was right. There was no further difficulty with the tribesmen as the engineers completed their mining and separating operations and finished filling the hold of the ship.

TWO days later, they were ready to leave.

"Can we take Big Stupe along with us when we go?" one of the crewmen asked Bruckner. Most of them were standing outside the ship, taking a last look around at Waterfields Planet. The ship had been made space-ready and all preparations for departure had been completed.

"I see no reason why not," Bruckner answered. "He certainly helps keep our morale up. I wonder," he went on in an expansive mood, "if you men realize why you get such a kick out of Big Stupe. You ought to read Hobbs' essay on the basis of humor sometime.

"Hobbs does a fine job of showing that we enjoy humor because it caters to our need for self-approval. When a monkey falls out of a tree, all the other monkeys laugh, because it makes them feel so clever and wise for not having fallen out of their tree. Whenever Big Stupe pulls one of his outlandish stunts, we are all reminded of how much smarter we are. It makes us feel good and so we like Big Stupe. We like anybody or anything that makes us feel superior."

A few of the natives who had been watching the preparations for departure from a distance walked closer.

Bruckner turned and waved cheerfully to them. "Farewell, friends. Perhaps we'll see you again in a few years." He paused. "I've been wondering," he said, pointing at Big Stupe, "what's your name for this bird here?"

"*Lacigule*," the native answered.

They left Big Stupe behind.

—CHARLES V. DE VET

—Continued from Back Cover

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